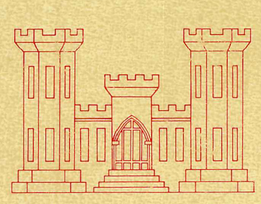
FORT CAMPBELL, KENTUCKY

TERRAIN ANALYSIS



PREPARED BY

SOIL SYSTEMS, INC.,

MARIETTA, GEORGIA

UNDER THE DIRECTION OF

THE TERRAIN ANALYSIS CENTER

US ARMY ENGINEER TOPOGRAPHIC LABORATORIES

FORT BELVOIR, VIRGINIA 22060

DECEMBER 1977

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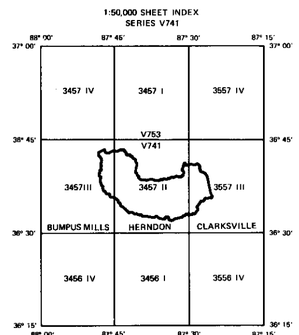
TABLE OF CONTENTS



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CONTRACT NUMBER DAAK-70-77-C-0071

DECEMBER 1977

I. INTRODUCTION

BACKGROUND

The requirement for this terrain analysis of Fort Campbell was stated in message P241854Z, Oct 75, from the Commander, FORSCOM to the Office Chief of Engineers (OCE), Department of Army, subject: "Terrain Analysis of Selected FORSCOM Installations." The FORSCOM requirement identified the installations including Fort Campbell, and cited topical coverage to be included in the studies. Responsibility for management and supervision of the program developed in response to the FORSCOM requirement was assigned by OCE to the Terrain Analysis Center (TAC), US Army Engineer Topographic Laboratories. At FORSCOM request, TAC responsibility also includes technical supervision and direction of FORSCOM troop units assigned to the program.

Scope and content of the topical coverage included in the FORSCOM requirement were developed jointly between representatives of TAC and FORSCOM Headquarters. Analytical and cartographic specifications for the studies were developed by TAC, coordinated with OCE and concurred in by FORSCOM Headquarters.

This study was prepared by Soil Systems, Inc. (SSI), Marietta, Georgia (Contract number DAAK-70-77-C-0071) under the direction of the Terrain Analysis Center (TAC) of the U.S. Army Engineer Topographic Laboratories (ETL), Fort Belvoir, Virginia. Earth Satellite Corporation, Chevy Chase, Maryland, provided cartographic services and technical support under sub-contract to SSI.

PURPOSE

In stating the requirement for terrain analyses of selected installations, FORSCOM indicated that the purpose of the program is to assist military planners in future stationing decisions. To achieve this purpose, planners must obtain an appreciation of the on-post terrain that includes among many other things, knowledge of the suitability for conducting field training exercises involving maneuverability of troops and military vehicles. The degree of maneuverability that can be achieved is a function of several terrain factors including slope, surface configuration, soils, vegetative cover, and surface drainage, all of which are treated in the studies.

Planners concerned with troop stationing also need certain off-post information such as statistics on housing, schools, hospitals, and public utilities in urban areas near installations, as well as pertinent data on airfields and ports in the vicinity. These things are also treated in the studies.

Since the program under which this study was prepared is intended to serve troop stationing requirements, the support provided by the program to environmental requirements is only incidental. While some of the information contained in the studies may be useful as environmental base line data, the studies are by no means complete environmental inventories of the kind required in support of environmental impact assessments.

SCOPE

In scope, the terrain analysis is a compendium of available data on the pertinent natural and manmade features of the reservation and an evaluation of their effects on tactical military operations. The program does not include basic research to fill gaps in these data although some short-term field investigations were performed to obtain ground truth and a general overall appreciation of terrain elements. Therefore, the scope of the analysis is limited primarily to those factors which have been documented by other authorities and to the results of analysis and evaluation of those factors by project technical specialists for topics such as cross-country movement, cover and concealment,and water resources.

The terrain analysis preparation process has necessarily involved analytical judgement in the selection of pertinent source data, resolution of data conflicts, recognition of interrelationships not previously made explicit, and the application of remote sensing to update certain critical, time-variant data such as vegetative cover and manmade features including roads, airfields, and facilities constructed outside of the cantonment areas.

LIMITATIONS

The study naturally reflects limitations in the quality, amount, and currency of the source data on which it is based. Numerous field interviews and selective use of remote sensing were employed in an effort to assure presentation of the latest and best information. Within the relatively complex topical scope of the analysis, however, there are a number of aspects on which source data have not been generated with the focus or recency desired to meet objectives fully. As noted under Scope, the study effort was not designed to include basic research as a means of filling gaps in data.

By design, the presentation is cast at a level of data coverage consistent with stated objectives. Users interested in deeper pursuit of data are referred to the List of Sources included as the last page of the study.

PRESENTATION

Maximum use of graphic presentation has been made throughout the terrain analysis. Supporting text is, as far as practicable, in tabular format keyed to the related graphics which follow. The primary map scale is 1:50,000. For Urban Areas (Cantonment Area), a larger scale map is used, and for Off-Post Features the map scale is 1:1,000,000.

STUDY AREA

The Fort Campbell military reservation encompasses an area of 42,478 hectares (104,963 acres) which straddles the border between southwestern Kentucky and northwestern Tennessee. Most of the reservation, 27,759 hectares (68,592 acres), is located within Montgomery and Stewart Counties in Tennessee, while the remaining 14,719 hectares (36,371 acres) are within the Kentucky counties of Todd, Christian, and Trigg. Clarksville, Tennessee is the closest urban area, located just southeast of the installation. Nashville, Tennessee, lies approximately 80 kilometers (50 miles) to the southeast of Fort Campbell.

Fort Campbell is located within the Highland Rim section of the Interior Low Plateau physiographic province. The Highland Rim on the reservation is mostly a gently rolling to rolling plain with many steep slopes in areas adjacent to streams. The area of steepest terrain and the highest local relief, between 50 and 67 meters (164 and 220 feet), is in the vicinity of Saline Creek, in the westernmost portion of the installation near the Kentucky-Tennessee line. The highest elevation is 219 meters (718 feet), also in the Saline Creek area, while the lowest elevation of 121 meters (397 feet) is near the southeastern boundary of Fort Campbell at the confluence of West Fork and Fletchers Fork Creeks. Most of the surface runoff drains eastward into the Cumberland River which is part of the Tennessee River watershed.

Vegetation on Fort Campbell exhibits the influence of past and present activities of man on the land. Approximately 45 percent of the total reservation area is either short grasslands or agricultural areas. The greater portions of these areas are within the drop zones and impact areas utilized for military training activities. Upland and lowland hardwoods cover an additional 35 percent of the installation, while planted loblolly pines are found in small plots covering about 15 percent of the total area. Vegetation growth is stimulated by the mild, humid climate of the region which averages 119.0 centimeters (46.9 inches) of precipitation per year. The average high temperature in July is 31.7°C (89°F) while the average low in January is -2.2°C (28°F).

II. DESCRIPTION AND MILITARY ASPECTS OF TERRAIN

A. SURFACE CONFIGURATION

Fort Campbell is sited upon a gently rolling to rolling plain containing some hilly to steep areas due to stream encroachment. The Reservation is within the Highland Rim section of the Interior Low Plateaus physiographic province.

LANDFORM TYPE	LANDFORM DESCRIPTION AND DISTRIBUTION	ELEVATION
1. Low Plains	The broad gently rolling to rolling upland plain is the primary landform of Fort Campbell. It extends entirely across the reservation and comprises 90 percent of the total area. To aid in a quick evaluation, this landform is broken down into two significantly different units.	
	A. The broad nearly level to gently rolling upland plain comprises the majority of the low plains classification. Areal relief is between 6 and 15 m (20 and 50 ft). Slopes generally 3 to 10 percent with a 2 to 12 percent range.	Over 95 percent of this unit lies between the elevations of 168 to 198 m (550 to 650 ft) above sea level. The lowest elevation is approximately 152 m (500 ft) along the Piney Creek near the center of the reservation. The highest elevation is 215 m (708 ft) near the south central perimeter.
	B. This unit comprises the rolling to steep terrain formed by incisement of encroaching streams. Areal relief is between 18 and 36 m (60 to 120 ft). Slopes vary from 8 to 45 percent. In a few instances the valley walls approach 60 percent slope.	The lowest elevation of 121 m (397 ft) occurs at the confluence of Little West Fork and Fletchers Fork at the eastern perimeter. The highest elevation of 195 m (640 ft) occurs near the northwestern corner of the reservation in Trigg County.
2. High Plains	Strongly rolling to steep topography within the Saline Creek watershed. Local relief is from 50 m (164 ft) to 67 m (220 ft). Slopes largely between 15 and 45 percent.	Elevations generally 140 m (460 ft) to 195 m (640 ft) above sea level. Lowest elevation 121 m (397 ft) where Saline Creek crosses perimeter. Highest elevation 219 m (718 ft) near northern edge of this area.

B. SURFACE DRAINAGE

All of the surface water at Fort Campbell drains into the Cumberland River then via the Ohio and the Mississippi Rivers to the Gulf of Mexico. There are no streamflow gaging stations on or near the reservation.

Flooding is a minor problem and of short duration, occurring only after a storm of cloudburst proportions. There are no streams on the reservation that could be called "Major Streams", the widest one is Little West Fork Creek which measures 12 m (40 ft) bank to bank. This might be attributed to the fact that an appreciable amount of water moves vertically through the soil, especially in areas with strong concentrations of sink holes.

Several beaver dams have been reported on the reservation.

TABLE B-1
DRAINAGE CHARACTERISTICS

DRAINAGE CATEGORIES	GENERAL	REGIME	WIDTH	DEPTH	VELOCITY AND DISCHARGE	BANKS	BOTTOMS
Watercourses							
Little West Fork Creek with major tributaries of Dry Creek and Piney Fork Creek (lower portion)	This watershed contains mostly perennial streams and drains approx. 2/3 of the surface runoff of the reservation in an easterly direction. Headwaters are small intermittent watercourses with stable channels. The streambed gradient is gentle throughout, falling 61 m (200 ft) in some 32 km (20 mi).	Some high water, Dec. through Apr., gradually receding to Aug. through Oct., the low water period. Water at low flow maintained by springs. Flood conditions are infrequent (< once in 5 yrs) and have a duration of only a few hours.	Approx. 12 m (40 ft) at bank-full flow, 8 m (25 ft) at normal flow, and 5 m (16 ft) at low flow.	Approx. 1.8 m (6 ft) at bank-full flow, 0.3 m (1 ft) at normal flow and 0.25 m (10 in.) at low flow. Scattered pools appreciably deeper.	Generally slow flowing except in headwaters. Mean annual discharge is about 1.53 m^3/sec (54.0 ft^3/sec).	Mostly silt or cherty silt. Generally 1.5 m to 1.8 m (5 to 6 ft) high and moderately steep, 35 percent to 50 percent slope, occasionally one bank might reach 70 percent slope for a short stretch.	Mostly gravel with a few areas of cherty silt. Short reaches of Piney Fork are bedrock.
Saline Creek with Dry Fork Creek	This watershed drains approx. 50 km^2 (19.3 mi^2) of the northwestern perimeter in a general southwesterly direction. The watershed is steep to hilly and the streambed gradient is 61 m (200 ft) in 10 km (6 mi).	Short periods of high water, Dec. through Feb. Low water, Aug. through Oct. Low flow maintained by seeps and springs.	Approx. 14 m (45 ft) at bank-full (1 yr in 10), 3 m (10 ft) at normal flow and 2.5 m (8 ft) at low flow.	Approx. 1.3 m (4 ft) at bank-full (once in 10 yrs), 0.2 m (8 in.) at normal flow and 0.1 m (4 in.) at low flow. A few shallow pools.	Fairly slow flowing except in headwaters. Mean annual discharge is about 0.27 m^3/sec (9.5 ft^3/sec).	Mostly sandy silt or silty sand. Generally 2.0 to 2.7 (6 ft to 8 ft) high and very steep, 70 percent slope to nearly vertical.	Sandy gravel to gravel.
Other Streams	Mostly intermittent streams flowing in stable channels.	High water, Dec. through April, with no flow Jul. through Nov. except for very short periods following thunderstorms.	Casey Creek, 10 m (33 ft) at bank-full and standing pools of water during late summer and fall. Fletchers Fork, 6 m (20 ft) at bank-full, 3 m (10 ft) at normal and 1.5 m (5 ft) at low flow. Low flow maintained by springs. Other streams narrower.	Most streams 0.6 m (2 ft) during short periods of high water during later winter and early spring, declining to zero (dry) during later summer and fall, except Fletchers Fork which is 1 m (3 ft) at high flow, 0.1 m (5 in.) at normal flow, and 0.05 m (2 in.) at low flow.	Most streams slow flowing except in headwaters. Mean annual discharges vary from 0.24 m^3/sec (8.5 ft^3/sec) to 0.001 m^3/sec (.04 ft^3/sec).	Mostly silt, some cherty silt. Variable heights generally 1 m (3 ft) or less, except Casey Creek and Fletchers Fork where the heights approach 1.5 m (5 ft) and the bank slopes are moderately steep 35 percent to 50 percent.	Mostly cherty silt or gravel.
Standing Bodies of Water (see Lakes and Reservoirs table below)							

TABLE B-2
LAKES AND RESERVOIRS

MAP NO.	NAME	GRID COORDINATES	APPROXIMATE HECTARES (ACRES)	STRUCTURE
1	No Name	610516	3.2 (8.0)	Abandoned Quarry Lake
2	Lake Taal	570485	11.3 (27.98)	Earth dam with concrete spillway
3	No Name	526458	3.2 (8.0)	Earth dam with earth spillway
4	Lake Kyle	412482	27.43 (67.75)	Earth dam with concrete spillway

TABLE B-3
FORDS*

MAP NO.	GRID COORDINATES	BOTTOM	APPROX. DEPTH M (FT)	APPROX. WIDTH M (FT)	REMARKS
1	503522	Gravel#	0.45 (1.5)	9 (30)	4-wheel drive vehicles
2	328553	Gravel	0.30 (1.0)	7 (23)	4-wheel drive vehicles
3	322558	Gravel	0.30 (1.0)	8 (26)	4-wheel drive vehicles
4	297576	Gravel	0.15 (0.5)	3 (10)	4-wheel drive vehicles
5	319579	Gravel	0.10 (0.3)	3 (10)	All vehicles
6	309592	Gravel	0.10 (0.3)	2 (6)	All vehicles
7	308622	Gravel	0.10 (0.3)	2 (6)	All vehicles
8	344641	Gravel	0.15 (0.5)	3 (10)	4-wheel drive vehicles
9	356625	Gravel	0.10 (0.3)	2 (6)	All vehicles
10	360620	Gravel	0.10 (0.3)	2 (6)	All vehicles

* Only fords over perennial streams are shown. Fords adjacent to or in the immediate vicinity of bridges not shown. There are many fords over small [< 3 m (9.8 ft) wide] intermittent streams which provide easy passage most of the year.

\# Fords are located on natural gravel bars. The gravel varies in depth and rests on material which can range from silt loam (ML) to a clay gravel (GC). Only bank preparation has been necessary to permit passage.

FORT CAMPBELL, KENTUCKY

TERRAIN ANALYSIS

SURFACE CONFIGURATION

1.A	LOW PLAINS	Gently rolling to rolling upland plains. Areal relief between 6 and 15 m (20 and 50 ft), slopes generally in the 3 to 10 percent range.
1.B	LOW PLAINS	Rolling to steep terrain primarily adjacent to large stream courses. Areal relief between 18 and 36 m (60 and 120 ft), slopes generally in the 12 to 30 percent range.
2.	HIGH PLAINS	Strongly rolling to steep terrain of the Saline Creek watershed. Local relief is from 50 m (164 ft) to 67 m (220 ft), slopes mostly in the 15 to 45 percent range.
	Escarpments	Nearly 60 percent slopes.

SURFACE DRAINAGE

Watercourse width*

- 10-15 m
- 3-10 m
- <3 m

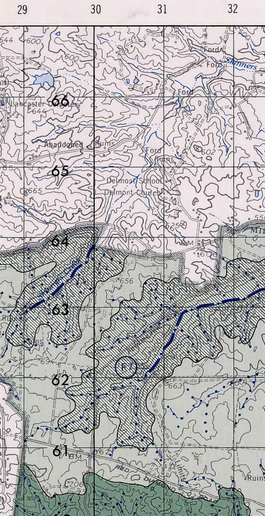
W1 — Reservoir

F1 — Ford

Earth dam

NOTE: Numbers refer to entries in table.

* Bank to bank gap width or water width where surface water becomes channelized and has a width greater than 1.5 meters (5 ft).



Scale 1:50,000

1 0 1 2 3 Statute Miles

1000 0 1000 2000 3000 4000 5000 Meters

CONTOUR INTERVAL 20 FEET

SUPPLEMENTARY CONTOURS 10 FEET

Prepared by Soil Systems, Incorporated, Marietta, Georgia, under the direction of the Terrain Analysis Center, U. S. Army Engineer Topographic Laboratories, Fort Belvoir, Virginia.
December 1977.

4 429 000m E.

4 440 000m N.

C. WATER RESOURCES

1. SURFACE WATER

All of the streamflow from Fort Campbell drains into the Cumberland River and then to the Gulf of Mexico by way of the Ohio and Mississippi Rivers. Flooding is not a major problem and is usually of short duration, occurring only after a storm of cloudburst proportion. Information on surface water resources is summarized in Table C-1. There are no streamflow gaging stations on or near the reservation; therefore, adequate data for an evaluation of the volume of water available from streams were not available. The drainage area of selected streams was measured and mean annual streamflow calculated utilizing a method developed by Woodruff and Hewlett (Water Resources Research, Volume 6, Number 5). These determinations are presented in Stream Discharge Determinations, Table C-2, and were used to develop the discharge categories applied in this study.

Actual discharge measurements were made for comparison purposes. These are presented in Table C-2. The discharge measurements made during the severe drought of 1954 were evaluated but not used in developing the categories because a drought of such severity is a rare event. The point at which each category shown on the map starts and ends depends on variations in flow, and moves upstream or downstream reflecting daily, seasonal or annual variations in the source area, and therefore changes in volume. In general, the high-flow period extends from December to March. The lowest flows may be expected in October.

TABLE C-1
SURFACE WATER RESOURCES

MAP UNIT	SOURCES	QUANTITY	QUALITY	DEVELOPMENT OF SOURCES
1	The lower reaches of Little West Fork Creek and Dry Creek downstream from Noah's Spring occupy the eastern portion of the reservation. The entire eastern half of the reservation is within 10 km (6.2 miles) of one of these sources. Most of the western half of the reservation is more than 10 km (6.2 miles) from these sources, with the extreme northwest corner as much as 19 km (11.8 miles) from the nearest sources. Streams are incised below the upland and generally flow on a fairly broad floodplain, e.g., the Little West Fork Creek. Dry Creek generally has a narrow floodplain up to the point where it joins Little West Fork Creek.	These streams afford more than 40,000 liters per minute, lpm (15,000,000 gallons per day, gpd) during mean annual streamflow. The flow of Little West Fork Creek at the east side of the former Clarksville Base is 91,650 lpm (34,864,371 gpd) and the flow in the lower reaches of Dry Creek is 58,560 lpm (22,276,678 gpd). During periods of high-water and floods, quantities are many times greater.	Natural surface waters are of good quality but possibly degraded slightly by wastes from Fort Campbell. A sanitary landfill site and the reservation's sewage treatment plant are the primary sources for this degradation. Several abandoned quarries within the floodplain of Little West Fork Creek are also contributing some sediment to the waters. Natural stream waters are moderately hard, normally low in suspended solids, and have close to neutral pH, (see analyses in Table C-4). Suspended sediment load varies with the season and is undesirably high during high-water periods. The waters are suited for all uses after treatment.	Access to the lower reaches of the Little West Fork Creek is limited by fairly steep banks to the floodplain. These banks may be 12 to 18 m (40-60 ft) above the floodplain. Banks on Dry Creek are lower, averaging 6 to 12 m (20-40 ft) in the lower reaches. The floodplain of Little West Fork Creek is wide and fairly flat. The floodplain of Dry Creek is narrow and almost nonexistent, in places slopes may be continuous from the creek to the upland surface. Trees, heavy undergrowth and wet areas hinder off-road access to these streams. There is no control of the flow of either stream by upstream structures. Velocities of 0.3 to 0.8 m/sec (1-2.5 ft/sec) have been reported.
2	The upper reaches of Dry Creek and Casey Creek; and the middle reaches of Weavers Creek, Piney Fork Creek, Saline Creek, Dry Fork Creek, Elk Fork Creek and Fletchers Fork Creek; are all within this map unit. All of the reservation is within 7 km (4.3 miles) of one of these sources. Dry Fork Creek and Saline Creek have an unusually wide floodplain, which ranges from 380 to 1,000 m (1,250-3,250 ft). Fletchers Fork and Piney Fork Creek flow on floodplains which range from 250 to 380 m (820-1,250 ft). The remainder of the streams flow on floodplains which average less than 100 m (328 ft).	Average yields range from 4,000 to 40,000 lpm (1,500,000 to 15,000,000 gpd). During high-water periods or floods, quantities of water would be much greater.	Data are limited for individual streams. Based on regional considerations and data, it is estimated that natural stream waters are moderately hard and are fairly low in total dissolved solids. Sources of industrial and municipal pollution are absent, but some bacterial contamination may occur in temporary ponds behind beaver dams. Suspended sediment loads may be undesirably high during high-water periods.	Access to the streams is limited by trees and heavy undergrowth, and in places by wet areas. Banks are steep on the lower reaches of the streams; bank heights are estimated to be about 1.5 m (5 ft) on the better developed floodplains and 5 m (16 ft) where floodplains are restricted or incised. Some of the upper reaches of the streams in this map unit have banks of about 1 m (3 ft). Velocities generally vary from less than 0.1 to 0.5 m/sec (0.3 - 1.6 ft/sec), but may be greater during high-water periods.
3	Sources are, for the most part, the upper reaches of Piney Fork Creek, Saline Creek, Casey Creek and Fletchers Fork Creek. Other sources are Jordan Creek and Skinners Creek, and tributaries to Dry Fork Creek, Saline Creek, Piney Fork Creek, Weavers Creek and Elk Fork Creek. Most areas within the reservation are within 6.5 km (4 miles) of one of these sources.	Average yields range from 400 to 4,000 lpm (150,000 to 1,500,000 gpd). During high-water or flood periods, quantities of water would be much greater.	No data are available for individual streams. Based on regional factors, it is estimated that natural stream waters are moderately hard. The pH is expected to be close to neutral. Suspended sediment load will increase during high-water or flood periods.	Same as above.
4	The upper reaches of perennial streams are the sources for this map unit. Most areas within the reservation are within 4.5 km (2.8 miles) of one of these sources, except for the extreme eastern portion of the reservation which may be as much as 8 km (5 miles) from the nearest sources in this unit. Streams occur on both wide and narrow floodplains, and in narrow valleys in the extreme northwestern portion of the reservation.	Average yields range from 40 to 400 lpm (15,000 to 150,000 gpd) throughout the year. Quantities will increase somewhat during periods of high-water.	Same as above.	Access to streams is hindered by trees and thick underbrush, and in places wet areas may also hinder access. Banks are low and steep on floodplains; longitudinal slopes are gentle. In the northwestern portion of the reservation, the streams are in narrow valleys with banks continuous with valley walls, slopes may range to 45 percent.
5	The extreme upper reaches of perennial streams, the portion that has minimal flow during the dryer part of the year, compose this map unit. Most areas within the reservation are within 2.5 km (1.6 miles) of one of these sources; however, the extreme distance is 10 km (6.2 miles) on the eastern portion of the reservation.	Average yields range from 4 to 40 lpm (1,500 to 15,000 gpd) during dry months. During wet months quantities may range from 40 to 400 lpm (15,000 to 150,000 gpd).	Same as above.	Access to streams is limited by trees and thick undergrowth. Banks are low and steep on floodplains; longitudinal slopes are gentle. In the northwest portion of reservation the streams in this map unit generally occur in narrow valleys with banks that are continuous with valley walls. Bank slopes are usually in the 45 percent range in this portion of the reservation, and can exceed 45 percent in some areas.
6	Upper reaches of seasonal streams, generally shown as intermittent streams on topographic maps, compose this map unit. Data are nonexistent. Stream volume and distance as delineated depend on the presence of springs, volume of spring flow, and volume of base flow. Streams range from steep gullies and ravines to channels incised in the upland. Streams in this map unit are generally less than 3 km (1.9 miles) apart.	In the gullies and incised channels, flow may persist throughout a wet period. Flow is generally in the range of 4 to 40 lpm (1,500 to 15,000 gpd) or water may be present as a series of pools. The channel may be dry during low precipitation periods. Quantities of water increase downstream, and after heavy storms yields may temporarily exceed 40 lpm (15,000 gpd).	No data are available for delineated stream segments. Based on regional considerations, it is estimated that natural stream waters are moderately hard and have a pH close to neutrality. Suspended sediment loads would be high downstream from gullies.	Access to streams is hindered by trees and brush. Slopes are gentle on divides, downstream slopes are steep, generally 30 to 45 percent, and in places exceed 45 percent.
7	Extreme upper reaches of ephemeral streams, shown as intermittent streams on topographic maps or not mapped at all, compose this map unit. Data are nonexistent and only representative streams are mapped. Streams range from shallow drainageways on upland surfaces to steep gullies. Streams generally less than 1.3 km (0.8 miles) apart.	In the shallow drainageways and gullies leading from the divides, flow is present only during rainfall and for only a few hours thereafter. Flow is generally less than 4 lpm (1,500 gpd) and the channel is dry most of the time. After heavy storms yields may exceed 4 lpm (1,500 gpd) temporarily.	Same as above.	Same as above.

TABLE C-2
STREAM DISCHARGE DETERMINATIONS
Based on 119.6 cm (47.1 in.) Mean Annual Precipitation

MAP NUMBER	STREAM	DRAINAGE AREA ABOVE STATION sq km	DRAINAGE AREA ABOVE STATION sq miles	ACTUAL DISCHARGE 21 APRIL 1977 l/min	ACTUAL DISCHARGE 21 APRIL 1977 gals/day	COMPUTED MEAN ANNUAL DISCHARGE l/min	COMPUTED MEAN ANNUAL DISCHARGE gals/day
1	Fletchers Fork Creek	67.3	26.0	10,148	3,860,194	24,522	9,328,359
2	Fletchers Fork Creek	31.8	12.3	4,554	1,732,521	11,574	4,402,839
3	Piney Fork Creek	81.3	31.4	11,095	4,220,537	29,610	11,263,874
4	Piney Fork Creek	31.7	12.2	4,794	1,823,621	11,538	4,389,145
5	Piney Fork Creek	14.1	5.5	3,956	1,504,848	5,148	1,958,339
6	Unnamed tributary of Piney Fork Creek	7.5	2.9	2,535	964,173	2,718	1,033,948
7	Piney Fork Creek	68.1	26.3	9,476	3,604,848	24,804	9,435,634
8	Dry Creek	37.4	14.4	5,798	2,205,420	13,614	5,178,871
9	Unnamed tributary of Dry Creek	2.6	1.0	661	251,319	948	360,627
10	Casey Creek	39.8	15.4	5,169	1,966,186	14,490	5,512,108
11	Unnamed tributary of Casey Creek	1.5	0.6	522	198,473	546	207,703
12	Dry Fork Creek	8.4	3.3	3,600	1,369,468	3,078	1,170,895
13	Saline Creek	44.3	17.1	5,520	2,099,851	16,128	6,135,216
14	Unnamed tributary of Jordan Creek	8.1	3.1	2,273	864,620	2,946	1,120,681
15	Unnamed tributary of Elk Fork Creek	6.5	2.5	1,200	456,489	2,364	899,284

TABLE C-3
STANDING BODIES OF WATER
LAKES AND RESERVOIRS

MAP NUMBER	NAME	GRID COORDINATES	APPROXIMATE HECTARES (ACRES)	QUALITY
W-1	Lake Taal	570485	11.3 (27.98)	Good, moderately hard
W-2	No Name	526458	3.2 (8.0)	Poor, high sediment level after rainfall
W-3	Lake Kyle	412482	27.43 (67.75)	Good, moderately hard
W-4	No Name	610516	3.2 (8.0)	Poor, old quarry site

TABLE C-4
ANALYSIS OF SURFACE WATERS, FORT CAMPBELL*

MAP NO.	STREAM	DATE	TEMPERATURE °C	TEMPERATURE (°F)	pH NO UNITS	CONDUCTIVITY µMHO/CM	BOD_5	DISSOLVED OXYGEN	SUSPENDED SOLIDS	TOTAL DISSOLVED SOLIDS	NH_3-N	NO_3/NO_2-N	TOTAL KJELDAHL NITROGEN	TOTAL ORGANIC CARBON	TOTAL PHOSPHATE
							CONSTITUENTS IN MILLIGRAMS PER LITER (mg/l)**								
16	Little West Fork Creek	18-28 July 1975	20.1	(68.2)	7.86	282	0.50	8.25	10	195	<0.10	1.32	<0.10	3.1	0.05
17	Little West Fork Creek	18-28 July 1975	21.1	(70.2)	7.80	315	3.13	7.90	11	217	0.10	2.54	0.27	6.6	1.68
18	Little West Fork Creek	25-29 July 1975	21.4	(70.5)	7.70	318	1.13	6.60	16	223	0.21	3.06	0.23	3.0	0.96
19	Fletchers Fork Cre-	18-28 July 1975	18.9	(66.0)	7.75	277	0.50	7.56	12	186	<0.10	0.52	<0.10	4.8	0.05

*Analyses by Department of the Army, U.S. Army Environmental Hygiene Agency; average of analyses of daily samples.

**For purposes of this report, mg/l may be taken to be roughly equivalent to parts per million (ppm).

C. WATER RESOURCES (Continued)

2. GROUND WATER

During periods of ground water recharge, the subsoil acts much like a sponge, absorbing part of each rainfall and transmitting the water slowly downward to the water table. Practically all recharge from precipitation occurs from November through April. In the intervening months (May through October) evapotranspiration exceeds rainfall, and nearly all rain that seeps into the ground is absorbed by the soil. Large amounts of water are stored in the subsoil during the wet winter and spring months because the area of ground water recharge is much larger than the area of ground water discharge. A summary of ground water resources is given in Table C-5.

The subsoil aquifer usually has a low permeability, but where sufficiently thick, may yield moderate amounts of water. Wells developed in the subsoil aquifer must be cased to prevent caving. The largest amounts of ground water are in solution cavities in the bedrock where the subsoil is underlain by fairly pure, soluble limestone. Bedding planes apparently are the major control in the formation of solution cavities because most of the cavities are elongated in the horizontal direction. Joints provide the passageways for water to enter the limestone, however; and joints also exert control on cavity system development, as evidenced by the linearity of the cavities. Probably the best potential areas for large capacity wells are the broad floodplains bordering the major streams in the reservation. Drawbacks to the future development of ground water supplies in the floodplain areas are the threat of periodic flooding and the availability of large, nearby sources of surface water. Wells in the upland areas tap the same aquifer system, but farther below the surface. Since ground water movement is generally toward the floodplain, more dependable ground water supplies are available in the floodplains. Ground water quality information is summarized in Table C-6.

The alluvial aquifer consists mainly of sand and gravel and averages 15 to 25 meters (50-80 ft) thick. No water wells have been drilled into the alluvial aquifer on the reservation, possibly because of the non-dependable, highly fluctuating water supply. For these reasons this source was not considered significant enough to map. Water levels in wells developed in the alluvial aquifer would probably range from 1.5 to 9 meters (5-30 ft) below the land surface. Numerous springs occur throughout the reservation; most are suited only for residential use because the yield is low and subject to large seasonal fluctuations. There are only a few springs which have both an abundant and dependable flow. Information concerning these major springs is summarized in Table C-7. The primary water supply for the reservation is ground water obtained from Boiling Springs (Table C-7). This spring produced 6.1 million gallons per day in pumping tests. The remainder of the reservation water supply is provided by the auxiliary pumping station on Red River about 12.9 km (8 miles) southeast of the reservation boundary.

TABLE C-5
GROUND WATER RESOURCES

MAP UNIT	QUANTITY AND SOURCE	DEPTH	QUALITY	DEVELOPMENT OF SOURCES
1	The quantity of water ranges from *moderate* to *large* from deep wells, depending on the degree to which water bearing fractures and solution openings in the rock are penetrated. Well yields are erratic and somewhat unpredictable. Most drilled wells into the rock will yield less than 400 liters per minute, 1pm (150,000 gallons per day, gpd); a small percentage of rock wells should yield more than 1,890 lpm (719,000 gpd). The rock aquifer is limestone of the St. Louis and St. Genevieve formations. Springs occur in this unit and are the major source of supply.	Wells need to be no deeper than 46 m (150 ft) to get maximum supply. The water table is at the land surface in the perennial stream valleys, and the range in water table height during the year is small.	The water is fresh but is somewhat hard, being characteristic of many limestone waters of the world. Most of the water contains less than 400 milligrams per liter (mg/l)* of total solids, and the hardness as $CaC0_3$ averages about 215 mg/l. Other mineral constituents rarely occur in objectionable quantities. The chance of getting contaminated water is great because water infiltration from the ground surface on upland areas tends to concentrate in the larger solution openings beneath the lowlands as it moves toward the streams. Preventing contamination of water from large springs is a major problem in all such karst areas.	Springs are the conventional source of water supply in most karst regions, and their use on the reservation is reasonable. Their use does not change the subsurface hydrologic regime, as wells would do. Heavy withdrawal of water from wells would cause springs and streams to diminish in flow or dry up. The risk of cave-ins and subsidence of the land surface would also increase with development of wells.
2	The quantity of water ranges from *moderate* to *large* from deep wells, depending on the degree to which water bearing fractures and solution openings in the rock are penetrated. Well yields are erratic and somewhat unpredictable; although few wells exist, the prevailing trend in adjacent areas where similar hydrology and geology exist indicates that most drilled wells into the rock will yield approximately 38 lpm (145,000 gpd); a small percentage of rock wells should yield more than 1,890 lpm (719,000 gpd). The rock aquifer is limestone of the St. Louis and St. Genevieve formations.	Wells are commonly less than 60 m (200 ft) deep and are open below the top of the rock, which generally lies between 9 and 18 m (30-60 ft) below land surface. Above the hard rock is residual soil and silty material weathered from the dissolved impure limestone that formerly overlaid the present buried limestone furface; rock wells are cased through the silty material. Locally small supplies, 4 to 38 lpm (1,500 to 3,800 gpd) may be developed from shallow wells that have screens or slotted pipe in the saturated part of this material. The water table generally lies in the soft silty material above the rock and is commonly 7.5 to 15 m (25-50 ft) below land surface. The water table has not been mapped, but is considered to be a few feet higher in the spring than in the fall. Since this unit is based chiefly on upland topography, springs from the upland slopes develop mostly after periods of precipitation and are not dependable sources of water.	The water is fresh but is somewhat hard. The natural chemical quality of the water is similar to that in Map Unit 1. Below the zone of good circulation of water, 60 m (197 ft) or slightly less below land surface, the water is brackish. Contamination of water from Man's actions at the land surface is always a matter of concern in sinkhole (karst) areas. Fortunately, the fairly thick silty zone above the cavernous bedrock tends to prevent ready contamination in most places.	Because of the higher topographic position of this unit, springs cannot be developed, open-end wells cased to the top of rock, about 12 m (40 ft), would be the conventional development method. Danger to drilling rigs could occur by sinking into the ground as water is pumped out during drilling. Heavy pumping of water from wells is likely to cause sudden collapse of the land surface as sinkholes; damage to buildings, roads, and airfields could result. There is a danger in heavy, concentrated withdrawal of water from wells, especially in regards to land subsidence and drying up of springs.

*For purposes of this study, mg/l may be taken to be roughly equivalent to parts per million (ppm)

TABLE C-6
CHEMICAL ANALYSIS OF GROUND WATER
FORT CAMPBELL AREA

	UNITS	AVERAGE	MINIMUM	MAXIMUM
Temperature	°C	16.0	14.0	18.0
	°F	(60.0)	(58.0)	(65.0)
Silica	mg/l*	8.4	5.0	15.0
Iron	mg/l	0.11	0.04	6.9
Calcium	mg/l	63.0	44.0	384.0
Magnesium	mg/l	12.0	3.0	173.0
Sodium	mg/l	3.8	1.4	294.0
Potassium	mg/l	0.7	0.4	10.0
Carbonate	mg/l	0.0	0.0	18.0
Bicarbonate	mg/l	218.0	150.0	400.0
Sulphate	mg/l	40.0	4.0	1474.0
Chloride	mg/l	4.0	1.6	295.0
Nitrate	mg/l	0.7	0.1	15.0
Fluoride	mg/l	0.6	0.2	3.0
Dissolved Solids	mg/l	262.0	148.0	1948.0
Hardness as $CaCO_3$	mg/l	217.0	148.0	1408.0
pH	None	7.5	7.0	7.8

Analyzed by the U.S. Geological Survey, Quality of Water Branch; April 1965, 15 analyses, Montgomery County.

*For the purposes of this study, mg/l may be taken to be roughly equivalent to parts per million (ppm).

TABLE C-7
MAJOR SPRINGS
FORT CAMPBELL

MAP NUMBER	NAME	GRID COORDINATES	YIELD lpm*	YIELD gpd**	DATE MEASURED	QUALITY
1	Noah's Spring	506547	58,718	22,336,783	21 April 1977	Good quality, possible moderate levels of dissolved solids
2	Unnamed	327575	16,128	1,620,917	estimated	Good quality, fairly low in dissolved solids
3	Unnamed	532456	8,540	858,200	21 April 1977	Same as above
4	Boiling Springs +	547526	16,035	6,100,000	estimated	Same as above

* Liters per minute
**Gallons per day
\+ Pumped

FORT CAMPBELL, KENTUCKY

TERRAIN ANALYSIS

WATER RESOURCES

SURFACE WATER

FRESH WATER PERENNIALLY PLENTIFUL

1. Enormous* quantities available from the Little West Fork Creek and the lower reach of Dry Creek.
2. Very Large quantities available from widely spaced stretches of some streams, less than 7 kilometers (4.3 miles) apart.
3. Large quantities available from stream stretches within 6.5 kilometers (4 miles) from any point on the reservation.
4. Moderate quantities available from upper reaches of streams within 4.5 kilometers (2.8 miles) from any part of the reservation. Quantities increased during high-water periods.

FRESH WATER SEASONALLY PLENTIFUL

5. Small quantities available from stretches about 2.5 to 10 kilometers (1.6 - 6.2 miles) apart; moderate quantities available during high-water periods.

FRESH WATER SCARCE

6. Small quantities available from minor tributaries about 3 kilometers (1.9 miles) apart; moderate quantities available during high-water periods.
7. Meager quantities available during most of the year from headwaters of streams generally less than 1.3 kilometers (0.8 miles) apart; frequently dry; may have continuous small amounts in high-water periods; only representative streams mapped.

▼1 Location of single discharge computation point for water quality sample point.

W2 Location of standing water body.

GROUND WATER

FRESH WATER GENERALLY PLENTIFUL

1. Moderate quantities are generally available from cavernous limestone; large quantities if water-bearing fractures or solution openings are penetrated within 46 meters (150 ft) of the land surface.

FRESH WATER LOCALLY PLENTIFUL

2. Small quantities available from cavernous limestone; moderate to large quantities if water-bearing fractures or solution openings are penetrated within 60 meters (200 ft) of the land surface.

Spring

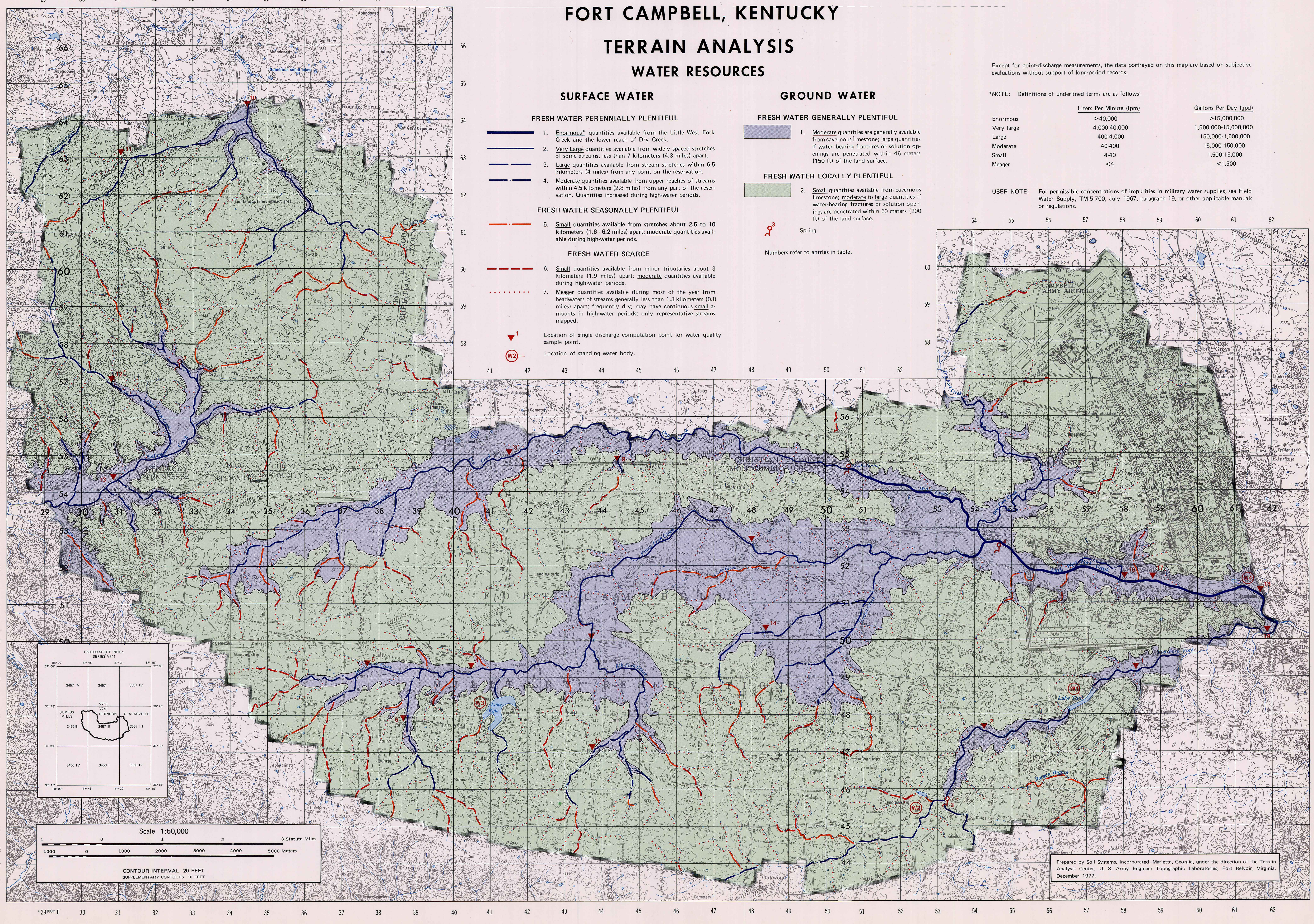
Numbers refer to entries in table.

Except for point-discharge measurements, the data portrayed on this map are based on subjective evaluations without support of long-period records.

*NOTE: Definitions of underlined terms are as follows:

	Liters Per Minute (lpm)	Gallons Per Day (gpd)
Enormous	>40,000	>15,000,000
Very large	4,000-40,000	1,500,000-15,000,000
Large	400-4,000	150,000-1,500,000
Moderate	40-400	15,000-150,000
Small	4-40	1,500-15,000
Meager	<4	<1,500

USER NOTE: For permissible concentrations of impurities in military water supplies, see Field Water Supply, TM-5-700, July 1967, paragraph 19, or other applicable manuals or regulations.



Prepared by Soil Systems, Incorporated, Marietta, Georgia, under the direction of the Terrain Analysis Center, U. S. Army Engineer Topographic Laboratories, Fort Belvoir, Virginia. December 1977.

D. ENGINEERING SOILS

The table below and the accompanying engineering soils map were prepared to give an indication of the engineering properties and distribution of the major soils groups. The accuracy of the information provided is considered to be reliable and adequate for general planning. It is presented for use as a guide and is not intended to supplant detailed on-site investigations for specific uses.

The map was produced after detailed stereoscopic examination of aerial photography and correlation with the available information from the sources used. In addition, on-site visits and a low altitude aerial survey were made of questionable areas. A number of soil samples were taken and laboratory classification tests were performed for verification purposes. In the interest of brevity, the soils were grouped into seven map units, each containing soils having generally similar engineering properties. These units have been evaluated as to limitations (slight, moderate or severe) for seven engineering applications. The characteristics causing the limitations are listed in a legend at the bottom of the table. Expediency dictates that within any of the map units, there will be, of necessity, inclusions of soils whose profiles differ from the typical profile. Effort was made to keep these inclusions to less than 10 percent of the delineated area. The profiles shown for each map unit are considered to be "average" for the unit and some variation may be expected in the actual thicknesses of the various layers.

Fort Campbell is located within the Highland Rim section of the Interior Low Plateaus physiographic province and the Pennyroyal major land resource area. The elevation ranges from about 121 m (397 ft) to 219 m (718 ft) above mean sea level. Essentially this area is a plain that has been modified by two drainage basins. The most westerly portion has been abruptly and severely dissected by Saline Creek leaving slopes and gullies that present severe problems for engineering use. The tributaries of Ringgold Creek (about three fourths of the reservation) with their more gentle gradients, take three times the distance to incise their channels to the same depths as the Saline. This makes for broad areas of poorly drained soils in the headwater area.

In general, the area has been covered with two to three feet of loess which rests upon weathered limestone of the Warsaw formation. The soils have a friable silt loam surface layer overlying a material having a moderate to high clay content. The thickness of the surface layer is dependent on the amount of erosion which has taken place. In a few areas this erosion has been so severe that all of the loess has been removed. The properties of the residual layer are directly influenced by the type and quality of the limestone that was weathered. Much of the limestone was of a cherty nature which left many angular fragments throughout the profile. The limestone in the northeast quadrant of this area was apparently of a purer nature as it weathered into a clay containing few to no chert fragments.

The depth to bedrock, with very few exceptions, ranges from about 2 m (6 1/2 ft) to >15 m (48 ft). The only exceptions are the small exposures of bedrock occasionally found in the escarpment-like slopes along major streams located in the most eastern portion of the military reservation.

Of considerable interest is an area along the western boundary where the loess soils have formed on a deposit of streamworn gravel. In some places this deposit has a depth approaching 16 m (50 ft) and is believed to have been formed during the Cretaceous Period.

It is important to point out the potential problem to many engineering uses of poorly drained to restrictively drained soil conditions in the central and southwestern portions of the reservation where generally the surface slopes are long, gradual and do not exceed 5 percent. This situation occurs because of a strata of extreme density near the base of the silt loam surface layer.This strata is often referred to as fragipan. It is a layer having reduced permeability sandwiched between layers of greater permeability. This can affect shallow excavations, trafficability, and many engineering projects.

The gravelly soils mapped in the western portion of the reservation are not clean enough to be used directly for concrete or other such needs. Washing of in-situ material is difficult due to the lenses of clay which are incorporated in this deposit. The streambeds do, however, contain gravel clean enough to be used in construction.

The clays that are found in the subsoil are, by and large, of a low or moderate shrink and swell potential. However, in and near the cantonment area they approach a "fat" condition and have a high shrink and swell potential.

SOIL CHARACTERISTICS AND SELECTED EVALUATIONS

MAP UNIT	AREA (km²) MAPPED ON RESERVATION	LANDFORM AND SLOPE	TYPICAL SOIL PROFILE[1]-LAYERS, THICKNESS OF LAYERS, DEPTH TO ROCK, UNIFIED ENGINEERING CLASSIFICATION (PROFILES NOT TO SCALE)	HIGH-WATER TABLE (DEPTH AND DURATION)	PERMEABILITY	SHRINK-SWELL POTENTIAL	RATING AND MAJOR KINDS OF LIMITATIONS FOR: SEWAGE LAGOONS	SANITARY LANDFILL	FOUNDATIONS FOR SMALL BUILDINGS	ROAD LOCATION	SHALLOW EXCAVATIONS	TRAFFICABILITY	BIVOUAC SITES	REMARKS
1	15 (5.8 mi²)	Steep ridges severely dissected. Slopes generally 15 to 40 percent with 8 to 45 percent range.	cm 20 ML Yellowish-brown silt GP GM GC Brownish to grayish-brown poorly graded gravel containing pockets of clay and some sand 240 Depth to bedrock ranges from 2 m to 15 m (6.6 ft to 49 ft)	None	>15 cm/hr (>6 in./hr)	Low	Severe (s,e)	Severe (s,e)	Severe (s)	Severe (s)	Severe (s,g)	Severe (s)	Severe (s,g)	Major soil series[3]: Brandon and small areas of Lax. In some areas the gravel may be replaced by sand. In areas protected from erosion, a layer of silt loam (loess) up to 35 cm (13.8 in.) thick may cover the ground. Excavation with hand tools made difficult by gravel up to 15 cm (5.9 in.) in diameter. The streamworn gravels are called "Coastal Plains Gravels" and are considered to be Cretaceous in age. Streambeds contain gravel clean enough to be used in construction. Gravel on hillsides could impede cross-country movement.
2	73 (28.2 mi²)	Narrow areas of nearly level floodplains bounding streams. Poorly drained upland depressions. Slopes generally less than 2 percent.	cm 120 ML or CL Brown silt with grayish-brown mottling with depth GC Stratified layers of gravelly sand, silt and clay Depth to bedrock generally many meters	0.3-1.2m (1-4 ft) Dec. thru Apr.	1.5-5.0 cm/hr (0.6-2.0 in./hr)	Low	Severe (f)	Severe (f)	Severe (f)	Severe (f)	Severe (f)	Severe (f)	Severe (f)	Major soil series: Arrington, Newark and Lindside. This unit also includes some small areas of soils that are a cherty silt loam throughout the profile (Cannon). In some areas the silt loam (ML) may trend towards a silty clay loam (MH or CH) at a depth of 120 cm (47 in.) The major engineering hazard is flooding during the winter and spring season. High groundwater table in this area.
3	90 (34.7 mi²)	Nearly level broad upland flats with restricted drainage. Slopes generally 1 to 4 percent.	Yellowish-brown to grayish-brown silt trending to a silty clay with depth cm 75 ML ML CL A restrictive fragipan* occurs at about 75 cm (30 in.) 130 CL Light brownish-gray silty clay loam Depth to bedrock >3 m (>10 ft)	0.0-1.0m (0-3 ft) Dec. thru Apr.	0.15-0.5 cm/hr (0.06-0.2 in./hr)	Low	Severe (w)	Severe (w)	Moderate (w)	Moderate (w,1)	Moderate (w)	Moderate (w,l)	Moderate (w)	Major soil series : Dickson, Guthrie, Taft, Sango and Lax. The major engineering problem is wetness during the winter and spring. The wetness is due to a fragipan occurring between 75 cm (29.5 in.) and 160 cm (63 in.) in depth. The Lax soils included in this unit contain gravel in the fragipan (40 to 70 percent by volume). The Lax soils overlay a cherty silty clay or silty clay loam.
4	75 (28.9 mi²)	Well drained gently rolling upland soils. Slope generally 3 to 8 percent with 2 to 12 percent range.	cm 50 ML Brown to dark brown silt ML or CL Brown to reddish-brown silty clay 90 MH Dark red clay Depth to bedrock >3 m (>10 ft)	None	1.5-5.0 cm/hr (0.6-2.0 in./hr)	Moderate to High	Moderate (e,s)	Moderate (l,v,s)	Moderate (l,v,s)	Moderate (l,v)	Slight (s)	Slight to moderate (l)	Slight (s)	Major soil series: Crider, Pembroke and the more gentle slopes of Pickwick. The surface two to three feet of this unit is formed from loess or windblown materials and is loamy and friable. Below this is a dark red clay material that is probably weathered from residual limestone. This dark red clayey soil has a classification of MH or CH, and is moderately expansive.
5	54 (20.8 mi²)	Complex of units 2, 4 and 6. Well drained, gently rolling uplands. Sinkholes effect nearly 50 percent of the area. Slope generally 2 to 6 percent with 2 to 12 percent range.	Sinkhole areas described in Unit 2. Well drained areas described in Units 4 and 6 (see comments) Depth to bedrock generally exceeds 2.0 m (6.6 ft)	0.3 m (1 ft) to None	1.5-5.0 cm/hr (0.6-2.0 in./hr)	Low to High	Moderate to Severe (e,f,s)	Moderate to Severe (c,f,l,v,s)	Slight to Severe (f,l,v,s)	Moderate to Severe (f,l,v,s)	Slight to Severe (f,s)	Slight to Severe (f,l)	Slight to (f,s)	Major soil series : Mountview, Pembroke, Arrington and Lindside. This area is mapped as a complex since the well drained soil is interspersed with poorly drained sinkholes. This unit has approximately 50 percent well drained soils and 50 percent poorly drained sinkholes. Severe solution activity has taken place in much of this area with the eastern portion of the reservation showing the most activity. Most sinkholes have no surface outlet and are drained by downward movement of the water. The Mountview (Unit 6) gradually changes going eastward into Pembroke (Unit 4). The cantonment area is predominately Pembroke.
6	77.5 (29.9 mi²)	Well drained upland soils and terraces. Slopes generally 3 to 8 percent with 2 to 12 percent range.	cm 30 ML Brownish silt CL or ML Brownish silty clay 75 GM GC ML or CL Cherty silty clay 150 Depth to bedrock >3 m (>10 ft)	1.8-3.0 m (6-10 ft) Dec. thru Apr.	1.5-5.0 cm/hr (0.6-2.0 in./hr)	Low to Moderate	Moderate (e,s)	Moderate (c,s)	Moderate (l,s)	Moderate (l)	Slight (s)	Slight (l)	Slight (s)	Major soil series: Mountview with the more strongly sloping areas of Dickson included. Statler is the primary non-flooding, terrace soil series.
7	42 (16.2 mi²)	Rolling to steep terrain derived from cherty limestone. Slopes generally 12 to 35 percent with 8 to 45 percent range.	cm 15 ML Cherty silt ML CL GM Silty cherty clay 60 MH CH Cherty silty clay to cherty clay GC 150 Depth to bedrock deep; generally>2m (6.6 ft) (see comments)	None	1.5-5.0 cm/hr (0.6-2.0 in./hr)	Low to Moderate	Severe (s)	Severe (c,e,s)	Severe (g,l,s)	Moderate (l,s)	Severe (c,g,s)	Severe (g,l,s)	Moderate (s)	Major soil series: Baxter, Humpherys and Cumberland (cherty variant). Average chert content at 60 cm is 15 to 35 percent; can go as high as 45 percent. Included in this unit are small outcrops generally less than 3 square meters occuring in steeper areas adjacent to streams. Variable depth to bedrock is generally greater than 2 meters.

[1] These are a composite weighted average of the layers and thicknesses of the soils which were grouped into each mapping unit. The actual characteristics in the field may vary considerably from those shown.

[2] The Unified Soil Classification System, Technical Memorandum No. 3-357, US Army Corps of Engineers, March 1953.

[3] Soils that have nearly similar characteristics are mapped as a soil series. The series is the common name of the soil. Each series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Many other minor soils are included in the map unit.

[4] Fragipan is a dense, compact layer within the soil which restricts the downward movement of water and plant roots. This layer tends to cause an artificial water table to be formed during long wet periods.

DEFINITION OF RATING TERMS

SLIGHT - relatively free of limitations, or limitations are easily overcome.

MODERATE - limitations can be overcome with good planning and/or careful design.

SEVERE - limitations are serious and are difficult to overcome.

SOIL RELATED PROPERTIES AFFECTING LIMITATIONS

c - clayey
e - excessive permeability
f - flooding
g - gravel
l - low bearing strength
s - slope
r - restricted permeability
v - volume change (shrink-swell)
w - wetness

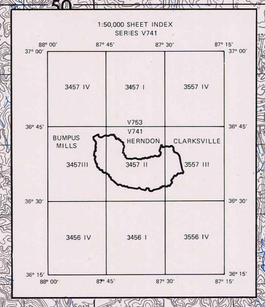
FORT CAMPBELL, KENTUCKY

TERRAIN ANALYSIS

ENGINEERING SOILS

1. Excessively drained, gravelly soils on strongly rolling to steep ridges.
2. Dominantly silts on floodplains and upland depressions; potential flooding hazard.
3. Nearly level, poorly drained uplands; silt loams to silty clay loams with impaired internal drainage.
4. Well drained, gently rolling upland clay soils.
5. Complex; gently rolling, well drained uplands interspersed with many sinkholes.
6. Gently rolling, well drained silty soils underlain with silty clays becoming cherty with depth.
7. Cherty soils on rolling to steep terrain; soils derived from cherty limestone.

1:50,000 SHEET INDEX
SERIES V741



Scale 1:50,000

1 0 1 2 3 Statute Miles

1000 0 1000 2000 3000 4000 5000 Meters

CONTOUR INTERVAL 20 FEET
SUPPLEMENTARY CONTOURS 10 FEET

Prepared by Soil Systems, Incorporated, Marietta, Georgia, under the direction of the Terrain Analysis Center, U. S. Army Engineer Topographic Laboratories, Fort Belvoir, Virginia. December 1977.

E. ENGINEERING GEOLOGY

The Table and accompanying engineering geology map indicate the engineering characteristics and distribution of the major geologic units. Unconsolidated and consolidated geologic units on the reservation are grouped into five map units, each with its own set of engineering characteristics. The units are evaluated on the basis of their ability to provide extents of flat to gently rolling land for construction purposes, their capacity to support light- or heavy-duty roads, airfields, and buildings with natural foundations, and their potential to provide natural material for construction and maintenance. From this evaluation, the units are placed into two categories; those having Numerous and those having Some Engineering Uses. All of the reservation area is in the Damaging Effects (modified Mercalli Scale VII and VIII) category of seismic risk.

Fort Campbell is in the Highland Rim section of the Interior Low Plateaus province. This section, often called the Pennyroyal Plateau, is underlain predominantly by bedrock of Mississippian age. Older units of Devonian, Silurian, and Ordovician ages are exposed along some of the more deeply incised rivers. The installation lies within the Central Stable Region tectronic province of the North American continent. This province is characterized by a southward-thickening sequence of Paleozoic and younger sedimentary rocks which overlie the Precambrian basement complex.

Formations ranging in age from Quaternary to Mississippian outcrop on the reservation. The western portion has been abruptly and severely dissected by Saline Creek, leaving slopes and gullies that cause engineering problems. The tributaries of Ringgold Creek, which drain most of the remainder of the base, create only locally steep escarpments, leaving much of the reservation virtually an undissected upland plain.

The predominant rock material of the Fort Campbell area is thin-to thick-bedded, fine- to coarse-grained limestone, partly dolomitic and cherty. There are two different limestone formations, the St. Louis and the St. Genevieve, both of Mississippian age. These formations are considered to have similar engineering properties, but the engineering geology map depicts them as two units differing in topography and relief.

One of these limestone units is a flat to gently rolling upland plain "pock-marked" with surface collapse features (sinkholes). The cavernous nature of this near-surface rock causes problems in foundation and drainage system construction on the reservation. The original estimate of depths required for foundation footings were revised when excavations encountered caverns which had to be blasted open and filled to provide adequate support. The cavernous nature of the bedrock and the abrupt variations in the thickness of overburden are factors requiring consideration in the planning of large construction projects. Both rock quarries and fill material (from the residual overburden) have been worked from this unit.

The other limestone unit has narrow to steep-sloped ridges and narrow to moderately wide U-shaped valleys. Much of the limestone in this unit may contain more impurities, such as chert, than the cavernous limestone unit, causing increased resistance to weathering, much greater relief, steep slopes, and a definite decrease in the amount of solution features. This unit may provide strong foundations, but is severely limited for engineering purposes by the steep relief.

The Tuscaloosa formation, an area of narrow rolling ridge tops and steep side slopes, overlies the older limestone in the western part of the installation. The unit consists of unconsolidated deposits of gravel, sand, silt, and clay. Gravel has been dug for road metal from this unit. Piles of sandstone rubble (colluvial material) occur at the base of the slopes of the Tuscaloosa formation or on nearby narrow valley floors.

Recent stream (alluvial) deposits throughout the reservation presently provide much granular aggregate material. The relief is low and the soil profile often well drained, but the possibility of flooding limits suitability of the unit for highway, railroad, airport, or building construction.

MAP UNIT	TOPOGRAPHY	ROCK DESCRIPTION	PHYSICAL CONSTANTS*	ENGINEERING EVALUATIONS	EXCAVATION FACTORS	PITS AND QUARRIES
1. Limestone, cavernous, in part dolomitic and cherty; approximately flat lying.	Unit consists of level and gently rolling to rolling upland plains. Most of the terrain has relief favorable for construction. Relief ranges from 3 m (10 ft) to 15 m (50 ft). Elevations vary from 152 m (500 ft) above sea level north of Little West Fork Creek near the ball park, to 214 m (702 ft) above sea level northwest of Oakwood in the southern part of the reservation. There is a general absence of large-scale surface drainage or surface dissection by streams; drainage is subterranean. The few drainages have angular intersections, narrow valleys, steep, nearly vertical sides, and flat valley floors. The drainage pattern is deranged. Land surface is irregular due to many roughly circular or elliptical sinkhole depressions scattered haphazardly over the surface. Sinkholes average 6 m (20 ft) to 305 m (1,000 ft) in diameter.	Unit consists of limestone, very light gray to pale brown to dark yellowish brown in color. Thicknesses up to 122 m (400 ft) have been mapped. Unit is thin- to thick-bedded, fine- to coarse-grained, and in part dolomitic. It is argillaceous, silty, fossiliferous, and clastic. Chert, light to dark gray and bluish gray to white, occurs in the unit and is nodular, layered, and spheroidal; chert and partially silicified coarse-grained clastic limestone occurs as discontinuous layers 7.6 cm (3 in.) to more than .3 m (1 ft) thick. In some areas the unit is represented only by residuum consisting of chert blocks and nodules as much as .3 m (1 ft) in diameter in a medium-textured soil matrix. Unit is sedimentary in origin and Mississippian in age. (The above description should be referred to for the rock description of Unit 4.)	**Elevation:** 162 m (530 ft) **Material:** Residual overburden; red flat clay with trace of sand **Liquid limit:** 54 **Plasticity index:** 35 **Specific gravity:** 2.70 **Triaxial compression:** Minor principle stress 0.50 T/sq ft Maximum deviator stress 2.65 T/sq ft Ultimate deviator stress 2.17 T/sq ft Controlled strain .76%/min **Material:** Bedrock at 18 m (60 ft) Unconfined compressive stress: 10,000 psi Modulus of elasticity: 10.3×10^6 psi	Unit provides numerous types of engineering construction material, from crushed rock aggregate to quarried building stone. Much of the unit consists of flat to gently rolling terrain; however, the extent of this gentle relief available for multi-structure emplacement is severely limited by an abundance of surface collapse features (sinkholes). Alinements available for highways and railroads are straight to curving, with cut-and-fill and grading required. The highly irregular rock surface makes grading difficult. Highways and railroads should avoid, if possible, the larger sinkhole areas, as they may be presently actively enlarging and collapsing. Subsurface investigations in this cavernous unit should be conducted during foundation studies; depth to bedrock over wide areas is uncertain due to irregular solution of underlying rock. Depth to bedrock is usually greater than 2 m (6.5 ft). Surface is ragged with deep "pockets" filled with clayey risidual material; risidual material including weathered rock must be removed to provide a suitable foundation for structures. If unable to avoid sinkhole areas during construction, they should be filled in, grouted, or capped to minimize subsidence. Residual limestone overburden is fairly fine in soil texture although it possesses a well drained profile; however, when compacted during construction, subgrade or fill reacts as a plastic soil material. Saturated soil conditions could be encountered from December to April during high ground water tables. In large air fields with heavy aircraft, soil conditions may be as important as rock conditions; permeability and drainage of residual soils must be checked to avoid subgrade failure. Bearing capacity of rock is suitable for foundations for most structures. Insignificant danger of shearing between rock and concrete. Unit may be hazardous for damsites, reservoirs, or tunnels because of seepage resulting from secondary permeability of the rocks (enlarged joints and caverns). Serious not only because of water immediately involved but because of continuous enlargement of subterranean channels. Landslides are not a problem because the overall relief is low. Availability and suitability of limestone for construction and maintenance is discussed in the ENGINEERING EVALUATION for Unit 4. Secondary permeability of unit makes it unsuitable for disposal of solid and liquid wastes. Drinking water may be polluted due to rapid contamination of the ground water from the surface through solution channels.	Rock excavation by drilling and blasting is required, but is not difficult, in highway, railroad, and airport construction. Excavation slopes are stable after stripping and scaling with bulldozers and graders. Rock can be leveled with mechanical tools. Residual overburden consists of 12-20 m (40-70 ft) of medium stiff to stiff reddish brown silty clay with limestone and chert fragments. Residual limestone overburden may be excavated with power equipment.	Inactive limestone quarries, numbers 1 and 2 are in this unit. Clayey borrow pits, numbers 1 and 2, are also present.
2. Alluvium	Unit consists of valley lowlands, bottomlands, and floodplains. Most of the terrain has relief favorable for construction. Valleys are U-shaped with steep valley walls typical of floodplains in limestone terrain. Valley widths vary from 31 m (100 ft) to 750 m (2,500 ft); elevations vary from 122 m (400 ft) to 152 m (500 ft) above sea level. Differences in elevation resulting from surface irregularities are minor in comparison with broad extent of the map unit. Stream (valley) alinements are often angular, as they follow joints of the limestone bedrock.	Unit consists of unconsolidated deposits of clay, silt, sand, and gravel. Thicknesses up to 30 m (100 ft) have been mapped. Silt and clay are brown and are derived from loess and from the residuum of Units 1, 3, and 4. Sand and gravel consist mainly of well rounded chert derived from Units 1, 3, and 4. Minor amounts of quartz sand, quartz pebbles, and sandstone pebbles and cobbles are included. Cobbles and pebbles of chert conglomerate cemented by iron oxides occur in minor amounts. The unit is fluvial in origin and Quaternary in age.	No Data	Unit is excellently suited to provide quality aggregate material. The level topography permits straight alinements in highway or railroad construction; alinements require little grading. Accessibility may be difficult during high surface water levels and impossible during flooding. Presence of oxbows, abandoned channels, or swamps on the larger floodplain areas may prevent easy access, especially during the high ground water levels from December through April. Bridges and thicker subgrades may be necessary. Fills must be protected from the scouring action of high water and flooding. The seasonal high ground water table and the possibility of flooding may seriously hamper work on deep foundations. Foundations for large structures require extensive piling on deep footings. Foundations for earth dams consisting of boulders, gravel, sand, or mixtures of these involve only seepage problems, because the compressive and shearing strengths of these materials are superior to those of the dam. Consolidation of the soil and settlement of the structure can be expected on foundations consisting of very fine sand, silt, and clay. When flooding is a possibility, airfield construction is inadvisable. Flooding makes fields inoperative and causes saturation of the subgrade with a subsequent loss of bearing capacity. These creek alluvial deposits provide an excellent source of aggregate for construction. Gravel is found in existing stream beds and in the smaller stream valleys. This gravel has been used extensively for surfacing roads and training areas on the reservation; also suitable for roofing stone. Unit is good to poor for the disposal of liquid and solid wastes. This use is severely limited by flooding, seasonal high water tables, and often by low permeability. Infiltration rates for surface soils range from 1.5 to 5.0 cm/hr (0.6-2.0 in./hr).	Rock excavation negligible for general construction, unless bedrock from underlying formation is encountered. Excavation easy with ordinary hand or power equipment.	Stream gravels are taken at locations 3, 4, 5, and 6. These are not "pits" as such, as the creeks do not allow the depressions to remain.
3. Mixed gravel, silt, and clay of the Tuscaloosa formation. Also small local deposits of sandstone rubble (colluvial deposits).	Unit consists of narrow rolling ridge tops that break abruptly to steep ridge slopes. Piles of unconsolidated blocks of broken rock (colluvial material) occur on narrow valley bottoms or on the base of slopes. Much of terrain is not useable due to steep slopes and high relief. Relief ranges from 6 m (20 ft) to 31 m (100 ft). Elevations vary from 168 m (550 ft) to 219 m (720 ft) above sea level. Unit usually adjacent to formations lower in elevation. Drainage pattern is moderately textured dendritic. Stream alinements are curving.	This unit consists of unconsolidated deposits of Tuscaloosa gravel, sand, silt, and clay. Thicknesses up to 15 m (50 ft) have been mapped. Gravel is light-gray, locally stained reddish brown. It is composed of well rounded pebbles and cobbles of chert up to 10.2 cm (4 in.) in diameter and minor amounts of pebbles and cobbles of quartzite and sandstone. In places, well rounded to angular cobbles of chert from underlying limestone formations are mixed with gravel. Locally near the base of formation, exposed patches of gravel are well cemented by iron oxide into conglomeratic masses or crusts. Sand and silt, color composition is similar to that of the gravel. Clay is gray and red with thin layers of white tripolitic clay occurring in places. Unit unconformably overlies older rocks as thick deposits on uplands, draping over hillsides and merging with alluvial gravels in some valleys.	No Data	Both the Tuscaloosa gravel formation and the associated sandstone colluvial areas are excellently suited to provide quality aggregate material. However, accessibility to potential deposits may be a problem due to steep terrain. Limited extents of flat to gently rolling land are available for multi-structure emplacement. Slopes present severe limitations for the construction of highways, railroads, airfields, or large buildings. Curving to sinuous alinements are necessary for roads and railroads; much cut-and-fill and grading required. Stability of cut slopes in the unconsolidated material is dependent upon appropriate slope ratios. Improper construction techniques could initiate erosion on steep slopes. Foundations are severely limited by the naturally steep slopes. Because high water table conditions are not generally encountered, saturated soils are not usually a problem. Shrink-swell of soil considered low. Gravel has been dug for road metal from this unit; large amounts of chert gravel are readily accessible, although many gravel pits are not currently being worked. These gravel soils are not generally clean enough to be used directly for concrete or other such needs. In some areas, gravel may be replaced by sand, and clay lenses are also present. Washing and screening is necessary. The chert gravel may be unsuitable for concrete aggregate. Good for lower courses of highway pavement, railroad ballast, roofing stone. Sewage lagoons and sanitary land fills are limited by steep slopes and permeability. Permeability is greater than 15 cm/hr (6 in./hr). Sandstone colluvium may be unsatisfactory for aggregate if it is argillaceous, soft, and highly absorptive. No data were	Excavation of the Tuscaloosa is not difficult with ordinary power equipment. Excavation with hand tools is made difficult by gravel up to 15 cm (6 in.) in diameter.	Gravel borrow pits numbers 7, 8, and 9 are mapped in this unit. Number 9 is presently inactive. The status of numbers 7 and 8 is not known.

E. ENGINEERING GEOLOGY (Continued)

MAP UNIT	TOPOGRAPHY	ROCK DESCRIPTION	PHYSICAL CONSTANTS*	ENGINEERING EVALUATIONS	EXCAVATION FACTORS	PITS AND QUARRIES
	Colluvial material consists of blocks and slabs of sandstone slumped together with blocks of limestone. Thicknesses of rubble up to 2.4 m (8 ft) have been mapped. Angular blocks .6 m to .9 m (2 ft to 3 ft) are common, although blocks up to 12 m (40 ft) in length occur. Both the Tuscaloosa gravel formation and the colluvium are sedimentary in origin. The Tuscaloosa is Cretaceous in age. The colluvium is also thought to be Cretaceous.			located concerning its quality. In general, sandstone was a low wearing value but occasionally may be used in the lower courses of pavement in highway construction. Good source of railroad ballast. Crushed stone may be too angular for use as roofing stone. Suitable for riprap.		
4. Limestone, highly to moderately dissected, including stream escarpments; solution features insignificant.	Unit consists of narrow steeply sloping to rolling ridges and narrow to moderately wide U-shaped valleys. Much terrain is not suitable for construction sites because of steep high slopes, narrow valleys, and steep creek escarpments. Steep escarpments ranging in relief from 15 m (50 ft) to 46 m (150 ft) occur adjacent to many of the creeks which flow through the base. Relief decreases with increased distance from creeks. Elevations vary from 137 m (450 ft) above sea level near Saline Creek in the western part of the reservation to 204 m (670 ft) above sea level in the southern part of the reservation (where the Montgomery and Stewart County boundary intersects the southern part of the reservation). Drainage pattern is moderately textured dendritic to rectangular. Angularity of drainages is noted in the creeks and gullies. Valley walls have angular intersections that follow jointing of limestone bedrock. Solution collapse features are insignificant.	Refer to description for Unit 1.	No Data	Unit provides numerous types of engineering construction material, from crushed rock aggregate to quarried building stone. Its primary limitation is the steep relief which makes accessibility by construction vehicles difficult. Insignificant areas of flat to gently rolling land are available for multi-structure emplacement. Alinements available for highways and railroads are sinuous, with much cut-and-fill and grading required. Terrain is unsuitable for large airfields. Depth to bedrock is less than that for Unit 1. Bedrock is at the surface in places along creek escarpments and in the steeper portions of hills along larger streams. Unit could provide a good foundation bed unless bearing capacity and permeability is impaired by hidden clay-filled subsurface cavities. In thin-bedded limestone, shear strength may be decreased by interbeds of clayey shale and clay; shearing may occur along bedding planes. Landsides are no problem, especially where the unit is thick-bedded, unless the limestone unit overlies a less resistant rock. Hard dense crushed limestone is a suitable aggregate source for highway construction if not used on the surface course. Although durability is satisfactory, limestone has a poor skid resistance. Aggregate is suitable for airfield bases if dense and well graded. Generally suitable for concrete (argillaceous limestone containing sulfides and chert is to be avoided for concrete aggregate) and bituminous aggregate. Good for railroad ballast, binders, as a raw material for the manufacture of cement, riprap, and building stone. Not recommended for roofing stone. Limestone can be used to face buildings if not near to a polluted acidic city atmosphere. Residual overburden has been utilized for fill material. The steep relief of this unit would make it unsuitable for disposal of solid and liquid wastes.	Rock excavation by drilling and blasting is required in all major construction. Rock excavation in Unit 4 limestone may be more difficult than in Unit 1 limestone, because of its greater hardness. Excavated slopes are stable after stripping and scaling. Residual overburden can be excavated with power equipment. Overburden is insignificant or only a few cm (in.) on extremely steep slopes.	Limestone rock quarry numbers 3 and 4 are inactive; the status of 5 is not known. Clayey borrow pit number 10 is used for fill and is mapped near a boundary of Unit 4.
5. Gravel; small local deposits	Unit is mapped as tiny deposits in local areas of Fort Campbell; no definite relationship between map unit or topography was noted.	Unit consists of unconsolidated deposits of gravel, white to rust-brown in color. The thickness of the unit is approximately 0 m to 1.5 m (0 ft to 5 ft). Abundant well rounded milk-white quartz pebbles are mixed with discoidal chert pebbles in a matrix of quartz and chert sand. Pebbles are mostly less than 2.5 cm (1 in.) in diameter. Unit is presumed fluvial in origin and is Tertiary or Quaternary in age.	No Data	Assumed to be a source of aggregate. Each gravel deposit may be uneconomically small to work. Accessibility may be a problem, as some deposits lie on steep-sloped limestone formations or on escarpments. Chert content may limit suitability for use as concrete aggregate. Suitable for lower courses of highway pavement, for railroad ballast, and for roofing stone. These deposits are actually too small to be evaluated for foundation considerations, or as sites for engineering construction.	Excavation easy with hand tools or ordinary power equipment.	No deposits have been worked for gravel.

*Source—Report, Geotechnical Investigation Geology and Seismology Proposed U.S. Army Hospital Fort Campbell, Kentucky.

F. SPECIAL PHYSICAL PHENOMENA

Fort Campbell is in the stable Nashville Dome Seismotectonic province. This area has generated only a few earthquakes in historic time and has experienced no major faulting since early Cretaceous and perhaps since late Paleozoic times.

The largest ground motion known to occur within reservation bound area resulted from three large earthquakes in the region around New Madrid, Missouri, in 1811 and 1812. Two of these were assigned Modified Mercalli intensities of XI, and the third an intensity of IX. In 1895, an earthquake with a Modified Mercalli intensity of IX was centered near Charleston, Missouri; it generated an intensity of V-VI at the Fort area. Intensities of VII may have been felt during the 1811-1812 events. The installation has probably experienced ground motion in excess of intensity V during all of these events.

Within an area of approximately 80 km (50 mi) around the area of the Fort, only five earthquake epicenters have been reported. The largest and nearest of these attained a Mercalli intensity of only IV.

The area is considered a minimal earthquake hazard.[1] Geologists predict the periodicity of an earthquake the size of those at New Madrid to be about 500 years. However, there could be one the size of the 1895 event that will affect the base in the next 30 years.

Engineering geologists recommend that an intensity of VIII be used at the Fort for design purposes. Intensity VIII ground motion may be correlated with a maximum horizontal acceleration of 0.25 g. In terms of surface stability during such an event, because of the cohesive nature of the subsurface soils, liquefaction will not be possible. It is anticipated that the properties of the subsurface material will not be significantly affected by the motion resulting from the above design earthquake.

[1] Report Geotechnical Investigation, Geology and Seismology, proposed U.S. Army Hospital, Fort Campbell, Kentucky, 1974. Dames and Moore.

FORT CAMPBELL, KENTUCKY

TERRAIN ANALYSIS

ENGINEERING GEOLOGY

NUMEROUS ENGINEERING USES

1. Limestone; cavernous, flat-lying
2. Alluvium
3. Gravel

SOME ENGINEERING USES

4. Limestone; highly to moderately dissected
5. Gravel; small local deposits

CONSTRUCTION MATERIALS

Borrow pit

Colluvial sandstone deposit; possible pit development site

Limestone quarry

Numbers refer to entries in table.

1:50,000 SHEET INDEX
SERIES V741

3457 IV | 3457 I | 3557 IV
V753
V741
BUMPUS MILLS | HERNDON | CLARKSVILLE
3457 III | 3457 II | 3557 III
3456 IV | 3456 I | 3556 IV

Scale 1:50,000

1 0 1 2 3 Statute Miles

1000 0 1000 2000 3000 4000 5000 Meters

CONTOUR INTERVAL 20 FEET
SUPPLEMENTARY CONTOURS 10 FEET

Prepared by Soil Systems, Incorporated, Marietta, Georgia, under the direction of the Terrain Analysis Center, U. S. Army Engineer Topographic Laboratories, Fort Belvoir, Virginia.
December 1977.

4 29 000m E.

4 44 000m N.

17

G. VEGETATION

Vegetation interpretations were made from 1:20,000 and 1:40,000 negative scale photographs dated 5/6/72 and 12/74; 1:50,000-scale U.S.G.S. topographic maps (photorevised 1975); and readily available technical literature. A limited number of vegetation field plots were sampled during site investigations (4/77).

All diameter measurements were taken at breast height and stem heights were taken as total heights. The major vegetation units present at Fort Campbell include short grasslands and agricultural areas (45%), upland and lowland hardwoods (35%), and planted loblolly pine (15%).

MAP UNIT	DESCRIPTION	DISTRIBUTION	REMARKS	COVER	CONCEALMENT
1	Coniferous trees; 50-100% crown cover density, averaging closer to 100%; predominantly planted loblolly pine with some eastern redcedar; heights range from 4.5 to 15 m (14.8-49.2 ft); diameters range from 6 to 34 cm (2.4-13.4 in.); spacing in older stands ranges from 3.3 to 4.5 m (10.8-14.8 ft), averaging less than 4 m (13 ft); natural pruning of lower limbs beginning in older stands; underbrush ranges from very little to very dense; Japanese honeysuckle and sawbrier are major underbrush species.	Mostly found in southern half of installation; very little in western part; none in impact areas. Some older stands located in north central and extreme southeastern portion of installation.	Pine not native; 6070 ha. (15,000 acres) planted at 1.8x2.4 m (6x8 ft) spacing prior to 1961 and 1.8x3.0 m (6x10 ft) since 1961; most planted between 1960 and 1970; poor growth; frost and fire have caused heavy mortality.	In older pine stands, cover from flat-trajectory fire of small arms for foot troops is fair to good; in younger stands it is poor.	Planted pines and native cedars offer good concealment year-round. Those areas affected by frost or fire provide only fair concealment. Coniferous trees provide good to excellent concealment for foot troops from aerial and ground observation. These areas offer good concealment for vehicles from aerial observation, and fair to good concealment for vehicles from ground observation.
2	Coniferous trees; 10-50% crown cover density; mostly planted loblolly pine mixed with eastern redcedar; tree heights and diameters average less than those of the coniferous trees with 50-100% crown cover density; average spacing is greater than 6 m (19.7 ft); very little natural pruning; undergrowth of short grasses, mostly broomsedge and Johnson grass, and deciduous scrub species including sumac, honeylocust, hawthorne, and several species of plum.	Scattered throughout installation; very few hectares in this unit.	Mostly stands with poor initial survival or severely affected by fire, frost, or insects.	Cover from flat-trajectory fire of small arms is poor for foot troops.	Concealment from aerial and ground observation for foot troops is fair to good year-round. Concealment for vehicles is poor to fair from aerial observation and fair from ground observation.
3	Deciduous trees; 50-100% crown cover density, averaging about 80%; consisting of two types: upland hardwood type dominated by black, scarlet, red and white oaks, pignut, mockernut and shagbark hickories, hard and soft maples, beech, elm, and basswood; and a bottomland hardwood type including pin, swamp chestnut and overcup oaks, slippery elm, ash, yellow poplar, sweetgum, and sycamore; heights range from 5 to 25 m (16.4-82 ft); diameters range from 15 to 50 cm (5.0-20 in.); spacing in older stands ranges from 2.8 to 4.8 m (9.2-15.7 ft), with an average of approximately 3.7 m (12.1 ft); excellent hardwood understory of dogwood, elm, ironwood, viburnums, and saplings of overstory species.	Large stands occuring throughout the installation.	Upland and bottomland types harvested by group selection methods; approximately 2,000,000 bd. ft/yr removed; stands treated may be opened up more than 50%.	Cover from flat-trajectory fire of small arms for foot troops is fair in younger stands of 15 to 25 cm (5.9-9.8 in.) diameter trees with numerous stems and good in older stands of larger diameters.	Concealment from aerial and ground observation is good to excellent for foot troops and vehicles during the growing season. Concealment from ground observation for foot troops is fair to good during the leafless season. Concealment from ground observation for vehicles is poor during the leafless period. Foot troop concealment is poor from aerial observation during the leafless season. Concealment from aerial observation for vehicles is nonexistent during this period. Growing season generally ranges from late April through late October.
4	Deciduous trees 10-50% crown cover density, averaging closer to 50%; predominantly upland hardwood types including black, scarlet, red and white oaks, pignut, mockernut, and shagbark hickories, red maple, beech, elm, basswood, blackgum and black cherry; heights generally less than 20 m (66 ft); diameters average close to 30 cm (11.8 in.); spacing is wide, usually greater than 6 m (19.7 ft) between trees; excellent regeneration of overstory species; openings characterized by deciduous brush and cedar.	Scattered locations throughout installation.	Most areas mapped as this unit represent aggregations of small areas of 2 to 4 ha. (5-10 acres) of hardwoods and equal areas of grass or brush each too small to map as an individual unit. Other areas of this unit have recently been harvested by group selection, where greater than 50% of the canopy was removed. Approximately 600 ha. (1500 acres) are harvested in this manner every year. It takes about 10 years for the canopy to close again.	Cover from flat-trajectory fire of small arms for foot troops is poor.	These areas offer good concealment for foot troops from ground and aerial observation during the growing season. Concealment for foot troops from ground observation is poor to fair during the leafless season. Concealment for vehicles from ground observation during the growing season is fair. Concealment for vehicles from aerial observation is fair during the growing season. During the leafless season concealment for vehicles is poor. Growing season generally ranges from late April through late October.
5	Mixed deciduous and coniferous trees; 50-100% crown cover density, averaging about 90%; loblolly pine and eastern redcedar mixed with upland hardwood types including northern red, scarlet, southern red, black, white and post oaks, pignut and shagbark hickories, blackgum, red maple and American elm; heights range from 5 to 20 m (16.4-65.6 ft); diameters range from 6 to 40 cm (2.4-15.7 in.); average spacing of 3 to 5 m (9.8-16.4 ft); undergrowth of saplings and brush.	Scattered small blocks throughout installation.	Mostly areas of planted pine in blocks too small to map separately, interspersed with equally small blocks of deciduous trees. Only a few endemic mixtures of hardwood-cedar occur on the installation.	Cover from flat-trajectory fire or small arms for foot troops is good.	Excellent concealment from aerial and ground observation for foot troops is provided during the growing season. Vehicles are afforded good concealment from ground observation and fair to good concealment from aerial observation during this season. During the leafless season foot troops are provided with good concealment from ground observation and fair to good concealment from aerial observation. Only fair concealment during the leafless period from both ground and aerial observation is provided for vehicles. Growing season generally ranges from late April through late October.
6	Mixed deciduous and coniferous trees; 10-50% crown cover density, averaging 20%; predominant species include red, black, and white oaks, pignut and shagbark hickories, blackgum, red maple and winged elm; heights average slightly less than 15 m (49.2 ft); diameters range from 6 to 30 cm (2.4-11.8 in.); average spacing is in excess of 7 m (23 ft); as in most open types the undergrowth is thick with numerous saplings, shrubs and weed species.	Scattered small blocks throughout installation.	Pine plantations on poor soils with poor survival where hardwood competition has not been very great.	Cover from flat-trajectory fire of small arms for foot troops is poor.	Concealment for foot troops from aerial and ground observation is fair during the growing season and poor during the leafless season. Concealment for vehicles is poor during both seasons. Growing season generally ranges from late April through late October.
7	Coniferous scrub; 50-100% crown cover density, averaging 70%; eastern redcedar and loblolly pine predominate; stems average 4 m (13.1 ft) in height; diameters are small, less than 7 cm (2.8 in.); average spacing is 3 to 5.5 m (9.8-18 ft); undergrowth consists of grasses, bluestem and purpletop predominate.	Scattered isolated areas throughout the central portion of the installation.	Mostly areas of very poor pine growth; trees are somewhat stunted.	Cover from flat-trajectory small arms fire for foot troops is poor.	Concealment from aerial and ground observation for foot troops is fair to good year-round. Concealment for vehicles is poor to fair from aerial observation and fair to good from ground observation.
8	Coniferous scrub; 10-50% crown cover density, averaging around 30%; eastern redcedar and loblolly pine; heights to 4 m (13.1 ft); stem diameters to 10 cm (3.9 in.); average spacing greater than 6 m (19.7 ft); short grasses, mostly broomsedge, exists as undergrowth.	Scattered isolated areas throughout the central and south central portions of the installation.	Mostly areas of very poor pine survival and growth; some trees are permanently stunted.	Cover from flat-trajectory small arms fire for foot troops is poor.	Concealment for foot troops from aerial or ground observation is poor to fair. Concealment for vehicles is poor from both aerial and ground observation.
9	Deciduous scrub; 50-100% crown cover density, more nearly 100%; consisting of sumac, blackberry, honeylocust, greenbrier, winged elm, sweetgum, and several species of plums with very few eastern redcedar intermixed; heights less than 4.5 m (15 ft); stems very slender, less than 8 cm (3.2 in.); very closely spaced; bluestem and annual and perennial weed species make up the understory.	Numerous scattered small areas throughout the installation.	Usually the result of succession in old fields to rapid growing deciduous species since there is no coniferous successional stage.	Cover from flat-trajectory fire of small arms for foot troops is poor.	Concealment for foot troops from ground observation is good to excellent during the growing season; however, troops are provided only fair concealment from aerial observation during this period. Concealment for vehicles is poor from aerial observation and fair from ground observation during this season. During the leafless season foot troops are provided with poor to fair concealment from ground observation, and poor concealment from aerial observation. Concealment for vehicles during this season is nonexistent from aerial and poor from ground observation. Growing season generally ranges from late April through late October.
10	Deciduous scrub; 10-50% crown cover density, patchy, occasionally dense; sumac, blackberry, honeylocust, greenbrier, winged elm, and Japanese honeysuckle; heights less than 4.5 m (15 ft); stems 2.0 to 6.0 cm (0.8-2.4 in.) in diameter; short grass and weed species occupy the openings.	Scattered small blocks throughout the installation.	Many larger open areas that were formerly in cultivation and were not planted in pine.	No cover from flat-trajectory fire of small arms for foot troops.	Concealment from ground observation for foot troops is fair to good during the growing season and poor to fair the rest of the year. Concealment for foot troops from aerial observation is poor year-round. Concealment for vehicles is poor from aerial and ground observation year-round. Growing season generally ranges from late April through late October.
11	Mixed coniferous and deciduous scrub; 50-100% crown cover density consisting of loblolly pine and eastern redcedar mixed with upland hardwood saplings and scrub species such as sumac, honeylocust, winged elm, blackberry and greenbrier; heights less than 4.5 m (15 ft); stems very slender, 2 to 8 cm (0.8-3.4 in.); very closely spaced; often intertwined with honeysuckle and other vines.	A large area of this unit is located in the south central portion of the installation. Other areas are small and scattered along the northern central portion of the installation.		Cover from flat-trajectory fire of small arms for foot troops is poor.	Concealment from aerial observation for ground troops is fair to good during the growing season, and is poor to fair all other times. Concealment from aerial observation of vehicles is poor year-round. Concealment from ground observation for foot troops is good during the growing season and fair after leaffall. Concealment from ground observation for vehicles is fair to poor year-round. Growing season generally ranges from late April through late October.
12	Mixed coniferous and deciduous scrub; 10-50% crown cover density; mostly loblolly pine and some eastern redcedar mixed with deciduous scrub species, such as sumac, honeylocust, several species of plum, several woody vines and some scrub oaks; heights less than 4.5 m (15 ft); very slender stems, usually less than 6 cm (2.4 in.); very widely spaced stems, averaging greater than 8 m (26.2 ft); broomsedge, Johnson grass, and purpletop occupy the openings.	Few areas scattered throughout the installation.	Old field pine plantations with very poor survival. Usually surrounded by other cleared land causing regeneration of deciduous species to be poor. Some areas classified as 10-50% mixed scrub are open ridgetops with a mixture of cedar and scrub oaks.	No cover from flat-trajectory fire of small arms for foot troops.	Concealment from aerial or ground observation for foot troops or vehicles is generally poor year-round.
13	Short grasses; broomsedge and Johnson grass predominate; height averages less than 1 m (3.3 ft).	Dominant vegetation in the impact areas and drop zones. Occurs throughout the rest of the installation as fallow farmland and wildlife food plots.	Many of the drop zones are tilled each spring but not planted. This is done to maintain the area in grasses.	No cover from flat-trajectory fire of small arms for foot troops.	No concealment for foot troops or vehicles is afforded.
14	Agricultural land; predominantly corn to 2 m (6.5 ft) in height.	Mostly found in drop zones.	Crop areas in the drop zones are rotated each year. These zones are a dynamic mixture of grass and agricultural areas, which are leased to private farmers.	No cover from flat-trajectory fire of small arms for foot troops.	Good concealment is provided for foot troops from ground observation in mature corn crops (late summer). Otherwise, concealment is nonexistent.

FORT CAMPBELL, KENTUCKY

TERRAIN ANALYSIS

VEGETATION

FORESTS

1. Coniferous trees; medium to dense spacing
2. Coniferous trees; nearly open to medium spacing
3. Deciduous trees; medium to dense spacing
4. Deciduous trees; nearly open to medium spacing
5. Mixed deciduous and coniferous trees; medium to dense spacing
6. Mixed deciduous and coniferous trees; nearly open to medium spacing

SCRUB

7. Coniferous scrub; medium to dense spacing
8. Coniferous scrub; nearly open to medium spacing
9. Deciduous scrub; medium to dense spacing
10. Deciduous scrub; nearly open to medium spacing
11. Mixed coniferous and deciduous scrub; medium to dense spacing
12. Mixed coniferous and deciduous scrub; nearly open to medium spacing

GRASSLANDS

13. Short grasses

AGRICULTURAL LANDS

14. Agricultural land

OPEN

OPEN

Built-up areas; barren areas; and heavily used areas. Vegetation not a significant factor

1:50,000 SHEET INDEX
SERIES V741

88° 00' 87° 45' 87° 30' 87° 15'
37° 00'
36° 45'
36° 30'
36° 15'

3457 IV | 3457 I | 3557 IV
V783
V741
BUMPUS MILLS | HERNDON | CLARKSVILLE
3457III | 3457 II | 3557 III
3456 IV | 3456 I | 3556 IV

Scale 1:50,000

1 0 1 2 3 Statute Miles

1000 0 1000 2000 3000 4000 5000 Meters

CONTOUR INTERVAL 20 FEET
SUPPLEMENTARY CONTOURS 10 FEET

Prepared by Soil Systems, Incorporated, Marietta, Georgia, under the direction of the Terrain Analysis Center, U. S. Army Engineer Topographic Laboratories, Fort Belvoir, Virginia.
December 1977.

4 044 000m N.

4 029 000m E.

21

H. CLIMATE

Fort Campbell straddles the Kentucky-Tennessee border in the western regions of those states. Campbell Army Airfield, at which most of the following climatic data were taken, lies on the Kentucky side of the border, latitude 36°40'N, longitude 87°30'W, at an elevation of 174 m (571 ft). The surrounding area generally consists of gently rolling ground.

Summers are characterized by hot and humid weather and the winters are cool and also fairly humid. The mean high temperature during July is 31.7°C (89°F), while the mean low is 20.0°C (68°F). Almost half (14) of the days during July have a maximum of 32.2°C (90°F) or greater while, on the average, only one day during July has a maximum of less than 26.7°C (80°F). Occasionally, a daily maximum will top 38.8°C (100°F). The relative humidity during the warm part of the day (1300 LST) averages about 55% in July. The average January maximum is 7.2°C (45°F), and the average minimum is -2.2°C (28°F). Cold temperatures are possible as indicated by an occurrence of -24.4°C (-12°F). However, such cold is rare and only one day a year has a temperature below -17°C (0°F), on the average. About 22 days during January have a low of 0.0°C (32°F), or less. With a mean temperature of about 3°C (37°F) and a mean wind speed of 13 kmph (8 mph), January, the coldest month of the year, can be represented by a characteristic equivalent wind chill temperature of about -4°C (25°F), which is not a great hindrance to outdoor activity.

The average annual precipitation is about 1190 mm (46.85 in). The winter months are the wettest, with January, February, and March each averaging about 130 mm (5.12 in). The driest month is October, which averages only about 40% of the rainfall of the wettest months. The wintertime precipitation generally comes from extra-tropical cyclones which produce widespread and uniform areas of rainfall, while summertime precipitation falls mainly in the form of localized showers. March has the greatest number of days (eight) in which precipitation of greater than 2.5 mm (0.1 in) occurs, while this amount falls on about six days during each of the summer months and only three days during October.

Thunderstorms occur at an average rate of about 53 per year. The greatest frequency of occurrence is during July with an average of nine. Thunderstorms happen occasionally during the winter with both December and January averaging about one. The monthly frequency steadily increases throughout the spring to the maximum in July, and then decreases rapidly to the autumn rate of about two per month.

Winter precipitation falls mostly as rain. However, snowfall does occur from time to time. The average snowfall during March, which is the snowiest month, is about 80 mm (3.15 in). Monthly snowfalls of up to 660 mm (25.98 in) have been recorded in March while, in some years, March or any other month can go without any snowfall. The greatest reported 24-hour snowfall was 300 mm (11.81 in). The annual average snowfall is 250 mm 9.84 in), with a maximum of 900 mm (35 in) in 1960. Less than 35 mm (1 in) has been recorded in several years.

Prevailing winds are southerly throughout the year with the exceptions of February and October, when the direction turns to northerly. The average windspeed ranges from 15 kmph (9 mph) in February and March, to 7 kmph (4 mph) in August and July. Extremely strong winds are not common, with a record peak gust of about 100 kmph (62 mph).

Severe storms or tornadoes, damaging hail, or extreme winds appear only rarely in the general area. However, Fort Campbell is not immune from such phenomena and a slight chance of their occurrence always exists.

TABLE H-1
CLIMATIC SUMMARY[1]

Hopkinsville/Campbell AAF, Kentucky Latitude N36°40' Longitude W87°30' Elevation 174 M (571 Ft)

PARAMETER DESCRIPTION		UNIT OF MEASURE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	YEARS OF RECORD
Absolute Maximum Temperature		°C	23.9	26.7	27.8	30.6	35.0	41.1	41.1	39.4	40.0	34.4	28.3	25.6	41.1	13
Absolute Maximum Temperature		°F	75.0	80.0	82.0	87.0	95.0	106.0	106.0	103.0	104.0	94.0	83.0	78.0	106.0	13
Mean Daily Maximum Temperature		°C	7.2	10.0	12.8	20.6	25.6	30.0	31.7	31.7	28.3	21.7	13.9	8.9	20.0	13
Mean Daily Maximum Temperature		°F	45.0	50.0	55.0	69.0	78.0	86.0	89.0	89.0	83.0	71.0	57.0	48.0	68.0	13
Mean Daily Minimum Temperature		°C	-2.2	-0.6	-2.2	8.3	13.3	18.3	20.0	19.4	15.0	8.3	1.7	-1.1	8.3	13
Mean Daily Minimum Temperature		°F	28.0	31.0	36.0	47.0	56.0	65.0	68.0	67.0	59.0	47.0	35.0	30.0	47.0	13
Absolute Minimum Temperature		°C	-21.7	-24.4	-17.2	-2.8	1.7	6.1	13.3	11.7	4.4	-4.4	-20.0	-19.4	-20.4	13
Absolute Minimum Temperature		°F	-7.0	-12.0	1.0	27.0	35.0	43.0	56.0	53.0	40.0	24.0	-4.0	-3.0	-12.0	13
Mean Number Days Maximum Temperature ≥ 90° F (32.2°C)		days	0.0	0.0	0.0	0.0	1.7	9.4	13.1	13.9	5.1	0.3	0.0	0.0	13.5	13
Mean Number Days Minimum Temperature ≤ 32°F (0.0°C)		days	22.5	15.0	12.0	1.8	0.0	0.0	0.0	0.0	0.0	1.5	13.5	19.8	86.1	13
Normal Heating Degree Days (Base 65°F/18.3°C)		°C days	515.0	420.0	334.0	124.0	41.0	4.0	0.0	0.0	12.0	119.0	305.0	472.0	2346.0	30
Normal Heating Degree Days (Base 65°F/18.3°C)		°F days	927.0	756.0	602.0	223.0	74.0	7.0	0.0	0.0	21.0	214.0	549.0	849.0	4222.0	30
Normal Cooling Degree Days (Base 65°F/18.3°C)		°C days	0.0	0.0	7.0	9.0	68.00	166.0	221.0	205.0	100.0	24.0	0.0	0.0	800.0	30
Normal Cooling Degree Days (Base 65°F/18.3°C)		°F days	0.0	0.0	13.0	16.0	123.0	298.0	397.0	369.0	180.0	44.0	0.0	0.0	1440.0	30
Mean Dew Point Temperature		°C	-1.7	0.6	1.7	7.2	13.3	17.8	20.0	18.9	15.0	8.3	1.1	-0.6	8.3	13
Mean Dew Point Temperature		°F	29.0	33.0	35.0	45.0	56.0	64.0	68.0	66.0	59.0	47.0	34.0	31.0	47.0	13
Mean Monthly Precipitation		mm	125.0	135.4	132.3	99.3	106.7	88.9	87.1	83.8	69.1	52.6	106.9	109.0	1196.3	13
Mean Monthly Precipitation		in	4.92	5.33	5.21	3.91	4.20	3.50	3.43	3.30	2.72	2.07	4.21	4.29	47.1	13
Absolute Maximum Monthly Precipitation		mm	555.2	227.3	241.6	168.7	285.8	225.0	205.0	208.5	165.1	146.6	347.0	221.2	1807.7	30
Absolute Maximum Monthly Precipitation		in	21.86	8.95	9.51	6.64	11.25	8.86	8.07	8.21	6.50	5.77	13.66	8.71	71.17	30
Absolute Minimum Monthly Precipitation		mm	15.5	3.3	37.8	42.2	15.0	11.7	25.4	8.6	7.1	8.4	18.0	33.5	879.9	30
Absolute Minimum Monthly Precipitation		in	0.61	0.13	1.49	1.66	0.59	0.46	1.00	0.34	0.28	0.33	0.71	1.32	34.64	30
Mean Number Days Precipitation ≥ 0.1 in (2.54 mm)		days	7.2	7.8	8.4	7.7	7.3	6.3	6.9	5.2	4.8	3.4	5.8	6.7	77.5	13
Mean Number Days Thunderstorms		days	1.3	2.5	3.6	5.4	6.9	8.1	9.1	7.0	3.5	1.9	2.3	1.3	52.9	13
Mean Monthly Snowfall		mm	66.0	48.3	76.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	27.9	30.5	256.5	13
Mean Monthly Snowfall		in	2.6	1.9	3.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.2	10.1	13
Mean Snow Depth		mm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	35
Mean Snow Depth		in	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	35
Maximum Snow Depth		mm	228.0	178.0	381.0	25.0	0.0	0.0	0.0	0.0	0.0	0.0	102.0	203.0	381.0	35
Maximum Snow Depth		in	9.0	7.0	15.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	8.0	15.0	35
Mean Number Days Snowfall ≥ 1.5 in (38.1 mm)		days	0.6	0.3	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	1.9	13
Mean Percent Relative Humidity		%	76.0	75.0	69.0	65.0	71.0	72.0	73.0	72.0	70.0	68.0	67.0	75.0	71.0	13
Mean Number Days Ceiling ≥ 2000 ft (609.6 m) and Visibility ≥ 3 mi (4.828 km) and Surface Wind Speed ≤ 10 kts (11.15 mph, 18.51 kmph)	at 1800 LST	days	18.5	15.8	19.1	20.5	25.1	26.6	27.1	29.1	27.8	27.2	22.4	20.2	279.4	13
	at 0000 LST	days	18.2	17.4	18.5	22.6	25.8	27.8	28.9	29.3	26.7	26.6	21.4	20.2	283.4	13
	at 0600 LST	days	15.7	15.2	16.1	19.4	24.0	25.4	24.6	24.9	23.3	20.8	18.2	18.2	245.8	13
	at 1200 LST	days	11.8	10.6	10.8	12.8	17.1	21.1	22.7	23.2	19.9	19.9	14.2	13.3	197.4	13
Mean Number Days Ceiling ≥ 2500 ft (762.0 m) and Visibility ≥ 3 mi (4.828 km)	at 1800 LST	days	21.9	20.6	25.7	27.7	29.5	28.9	30.2	30.5	29.2	28.6	26.1	23.2	322.1	13
	at 0000 LST	days	21.6	21.3	25.2	27.3	28.8	28.4	29.8	29.9	28.7	28.0	24.9	22.9	316.8	13
	at 0600 LST	days	19.6	18.5	21.0	24.7	27.2	26.9	26.0	25.3	23.9	21.9	20.4	20.9	276.3	13
	at 1200 LST	days	19.5	19.1	23.1	25.3	27.4	27.7	28.2	28.5	26.6	26.3	23.6	21.5	296.8	13
Mean Number Days Ceiling ≥ 6000 ft (1828.8 m) and Visibility ≥ 3 mi (4.828 km)	at 1800 LST	days	17.4	16.8	19.7	21.2	25.3	24.2	26.5	28.0	26.1	25.0	21.4	19.4	271.0	13
	at 0000 LST	days	16.9	17.2	19.5	23.2	24.9	26.4	27.6	28.8	26.7	25.7	20.7	18.2	275.8	13
	at 0600 LST	days	15.2	15.1	16.0	20.2	23.6	24.2	24.0	24.0	21.6	19.5	16.1	16.6	236.1	13
	at 1200 LST	days	15.8	16.4	16.0	17.3	17.9	18.5	17.8	19.2	20.6	22.7	19.1	17.8	219.1	13
Mean Number Days Ceiling ≥ 10000 ft (3048.0 m) and Visibility ≥ 3 mi	at 1800 LST	days	15.7	15.8	17.6	18.2	22.9	21.7	24.3	25.9	23.8	22.9	20.1	17.1	246.0	13
	at 0000 LST	days	15.8	15.8	17.0	20.0	23.0	25.3	26.6	26.7	25.1	23.6	19.1	16.1	254.1	13
	at 0600 LST	days	13.6	13.4	13.9	17.3	21.0	22.1	21.6	21.6	19.2	17.8	14.5	15.3	211.3	13
	at 1200 LST	days	14.3	14.0	14.2	15.4	16.3	17.5	16.6	17.8	19.0	21.2	17.4	15.9	199.6	13
Percent Frequency Surface Wind Speed ≥ 28 kts (32.24 mph, 51.9 kmph)		%	0.0	0.3	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	13
Percent Frequency Surface Wind Speed ≥ 17 kts (19.58 mph, 31.5 kmph)		%	4.5	5.6	6.7	5.2	2.0	0.9	0.6	0.5	1.0	1.7	3.8	3.6	3.0	13
Peak Gust		kmph	71.0	85.0	104.0	72.0	85.0	84.0	80.0	82.0	67.0	65.0	76.0	72.0	104.0	11
Peak Gust		kts	38.0	46.0	56.0	39.0	46.0	45.0	43.0	44.0	36.0	35.0	41.0	39.0	56.0	11
Mean Number Days Surface Wind Speed ≥ 17 kts (19.58 mph, 31.5 kmph) and No Precipitation	at 1800 LST	days	1.1	1.0	1.3	1.2	0.3	0.0	0.1	0.0	0.1	0.2	0.5	0.7	6.5	13
	at 0000 LST	days	1.2	1.1	1.8	0.7	0.0	0.0	0.0	0.1	0.1	0.2	1.0	0.9	7.1	13
	at 0600 LST	days	1.5	1.0	1.4	0.3	0.1	0.2	0.0	0.0	0.1	0.2	0.7	0.7	6.2	13
	at 1200 LST	days	1.9	2.8	3.4	3.6	1.5	0.3	0.5	0.3	0.2	1.2	1.4	2.4	19.5	13
Mean Number Days Surface Wind Speed 4-10 kts (4.61-11.52 mph, 7.4-18.5 kmph) and Temperature 33-89°F (0.6-31.7°C) and No Precipitation	at 1800 LST	days	13.3	14.9	18.1	18.5	18.8	17.5	16.2	15.3	15.2	15.4	14.8	13.2	191.2	13
	at 0000 LST	days	7.8	11.3	12.9	16.4	14.7	11.5	12.4	9.9	12.5	12.5	11.7	10.1	143.7	12
	at 0600 LST	days	7.6	9.0	13.2	16.3	15.1	14.0	13.3	10.5	11.7	12.3	10.9	10.2	144.1	13
	at 1200 LST	days	12.2	12.7	15.8	16.6	19.5	16.0	15.6	13.5	18.3	21.2	15.8	14.0	191.2	13
Mean Number Days With Occurrence Visibility ≤ 0.5 mi (0.8 km)		days	2.8	2.8	1.3	0.8	1.1	0.8	1.3	2.0	1.8	2.2	2.0	2.0	20.9	13
Percent Frequency Ceiling ≤ 5000 ft (1524 m) or Visibility < 5 mi (8.047 km)		%	48.5	43.7	40.9	29.2	24.7	21.8	23.5	21.5	20.3	26.5	36.3	44.1	31.8	13
Percent Frequency Ceiling ≤ 1500 ft (457.2 m) or Visibility ≤ 3 mi (4.828 km)	for 0000 - 0200 LST	%	22.5	19.5	13.0	6.2	6.3	3.9	4.1	4.8	5.6	10.0	12.6	18.0	10.5	13
	for 0300 - 0500 LST	%	25.7	23.9	17.0	10.1	11.1	8.5	11.1	13.7	11.0	15.9	14.5	20.9	15.3	13
	for 0600 - 0800 LST	%	32.3	29.8	24.1	13.1	10.3	7.2	12.0	12.4	13.5	22.6	27.2	28.9	19.5	13
	for 0900 - 1100 LST	%	29.4	25.2	18.8	10.9	8.8	6.7	7.3	5.7	7.5	9.2	15.7	24.1	14.1	13
	for 1200 - 1400 LST	%	24.7	21.8	13.7	6.9	5.9	3.8	2.4	2.3	4.2	5.6	9.5	18.3	9.9	13
	for 1500 - 1700 LST	%	21.3	19.2	10.5	4.6	4.7	3.0	2.5	1.1	2.5	5.7	8.8	16.5	8.3	13
	for 1800 - 2000 LST	%	19.0	18.9	10.0	4.1	3.2	1.6	1.2	0.9	1.3	4.7	8.1	16.8	7.5	13
	for 2100 - 2300 LST	%	20.6	16.9	10.9	4.3	4.1	1.9	0.9	1.7	2.4	6.6	9.5	17.4	8.1	13
Percent Frequency Ceiling ≤ 300 ft (91.4 m) or Visibility ≤ 1 mi (1.609 km)	for 0000 - 0200 LST	%	3.9	3.6	2.1	0.6	2.4	1.0	0.8	1.8	2.4	2.5	2.0	3.3	2.2	13
	for 0300 - 0500 LST	%	4.8	6.1	3.0	1.3	3.1	2.5	2.9	4.0	4.0	4.2	2.4	4.1	3.5	13
	for 0600 - 0800 LST	%	5.7	7.5	3.5	1.7	1.2	0.5	1.3	2.4	2.7	4.7	5.3	6.0	3.5	13
	for 0900 - 1100 LST	%	3.7	4.4	2.4	0.6	0;0	0.3	0.4	0.1	0.3	0.2	1.7	2.8	1.4	13
	for 1200 - 1400 LST	%	1.8	3.1	1.2	0.6	0.2	0.2	0.2	0.4	0.3	0.3	0.8	0.9	0.8	13
	for 1500 - 1700 LST	%	2.5	1.4	1.1	0.1	0.1	0.1	0.4	0.1	0.2	0.4	1.4	1.7	0.8	13
	for 1800 - 2000 LST	%	3.3	1.8	1.1	0.1	0.4	0.0	0.1	0.0	0.2	0.6	0.9	2.5	0.9	13
	for 2100 - 2300 LST	%	3.4	3.3	1.6	0.6	1.2	0.3	0.2	0.4	0.6	1.6	0.9	3.0	1.4	13
Mean Number Days Sky Cover ≤ 30% and Visibility ≥ 3 mi (4.828 km)	at 1800 LST	days	7.5	7.3	7.3	5.9	6.2	7.1	6.3	7.8	12.1	14.1	10.9	9.1	101.6	13
	at 0000 LST	days	10.1	10.1	11.6	13.1	15.4	16.6	16.6	18.4	18.2	18.5	12.9	10.2	171.7	13
	at 0600 LST	days	9.0	7.1	6.7	7.6	9.0	9.5	8.0	9.3	11.4	10.2	9.0	9.4	106.2	13
	at 1200 LST	days	6.2	5.9	6.1	5.6	4.7	3.8	3.2	4.6	9.7	11.7	9.0	7.1	77.6	13
Mean Number Days Ceiling ≥ 1000 ft (304.8 m) and Visibility ≥ 3 mi (4.828 km)	at 1800 LST	days	26.2	23.7	28.3	29.0	29.9	29.6	30.7	30.8	29.6	29.7	28.1	26.5	345.1	13
	at 0000 LST	days	25.4	23.4	28.1	28.9	29.4	29.1	30.4	30.1	28.8	29.1	27.3	26.6	336.6	13
	at 0600 LST	days	24.0	21.5	25.1	26.7	28.4	27.8	27.1	26.0	24.8	23.7	23.4	25.1	303.6	13
	at 1200 LST	days	25.3	23.0	28.0	28.4	29.7	29.5	30.5	30.7	29.3	29.7	27.3	26.7	338.1	13

[1] LST = Local Standard Time

TABLE H-2
EPHEMERIS (CENTRAL STANDARD TIME), FORT CAMPBELL

DATE	NAUTICAL TWILIGHT BEGINNING	NAUTICAL TWILIGHT END	SUNRISE	SUNSET	DATE	NAUTICAL TWILIGHT BEGINNING	NAUTICAL TWILIGHT END	SUNRISE	SUNSET	DATE	NAUTICAL TWILIGHT BEGINNING	NAUTICAL TWILIGHT END	SUNRISE	SUNSET	DATE	NAUTICAL TWILIGHT BEGINNING	NAUTICAL TWILIGHT END	SUNRISE	SUNSET	DATE	NAUTICAL TWILIGHT BEGINNING	NAUTICAL TWILIGHT END	SUNRISE	SUNSET
January 1	0602	1745	0703	1644	March 21	0455	1900	0552	1803	June 11	0321	2018	0430	1909	September 1	0422	1917	0520	1819	November 21	0534	1737	0634	1638
January 11	0603	1753	0703	1653	April 1	0440	1909	0535	1813	June 21	0323	2021	0431	1912	September 11	0433	1900	0529	1803	December 1	0544	1735	0644	1635
January 21	0601	1802	0700	1703	April 11	0423	1919	0521	1822	July 1	0328	2021	0434	1913	September 21	0440	1845	0537	1748	December 11	0551	1736	0651	1635
February 1	0555	1813	0653	1715	April 21	0409	1929	0508	1830	July 11	0332	2018	0440	1910	October 1	0449	1830	0545	1734	December 21	0557	1739	0658	1638
February 11	0547	1822	0644	1725	May 1	0355	1940	0456	1838	July 21	0341	2011	0447	1905	October 11	0458	1815	0554	1718					
February 21	0535	1831	0632	1736	May 11	0343	1951	0447	1847	August 1	0352	2000	0456	1856	October 21	0507	1802	0603	1706					
March 1	0525	1840	0621	1746	May 21	0332	2001	0437	1857	August 11	0402	1947	0504	1846	November 1	0517	1750	0614	1653					
March 11	0511	1850	0607	1754	June 1	0325	2011	0433	1903	August 21	0412	1932	0512	1833	November 11	0525	1743	0623	1645					

I. CROSS-COUNTRY MOVEMENT

MAP UNIT	GENERALIZED TERRAIN CONDITIONS	MOVEMENT OF TRACKED VEHICLES*	MOVEMENT OF WHEELED VEHICLES**	MOVEMENT OF FOOT TROOPS
1	Grasslands and agricultural lands (Vegetation Map Units 13 and 14, respectively) occur generally on gently rolling (slopes less than 3 percent) topography in low plains, but also occur in high plains on steeper (up to 15 percent) slopes. Soils are silts and clays of low plasticity (ML and CL), well drained internally and externally. Grasses are mainly broomsedge less than 1 m (3.3 ft) tall. Agricultural lands are usually planted in corn. Drainageways, usually dry, and streams lace these map units. The configuration of the drainageways is generally not severe, but severe confrigurations do occur infrequently. Even during wet periods, most locations drain well and soils remain firm. Wherever free water is visible (in roadside ditches, streams and drainageways, local depressions or sinkholes, blocked drainage situations) the proximate soils are likely to be soft.[1]	Unrestricted except in localized wet areas. Speed when traveling perpendicular to furrows is limited to about 25 kmph (15 mph) because of excessive vibration.	Unrestricted except in localized wet areas. Speed when traveling perpendicular to furrows is limited to about 20 kmph (12 mph). Drainageways can be crossed by selecting favorable spots.	Unhindered except in crossing of streams.
2	Areas containing nearly open to medium spaced pine, hardwood, scrub, brush, or combinations thereof, and also containing numerous pockets of closely-spaced vegetation (Vegetation Map Units 2,4,6,8,10, and 12). Occurs mainly in the low plains on slopes less than 5 percent. Soils are ML and CL, well drained internally and externally.[1] Numerous drainageways and streams intersect this map unit.	Except for the necessity to avoid pockets of dense vegetation and to maneuver around the individual trees and occasional wet soil areas,[1] tracked vehicles can move nearly as freely as in Map Unit 1.	The same factors that influence tracked vehicle movements also influence wheeled vehicle movement; however, wheeled vehicles can move freely in dry periods and with only minor hindrances in wet periods. Drainageways can be crossed by selecting favorable spots.	Unhindered except in traversing pockets of dense vegetation and crossing of streams.
3	Areas of pine, hardwood and pine-hardwood scrub, with medium to dense spacing (Vegetation Map Units 7, 9, and 11). This map unit occurs in the low plains on slopes less than about 5 percent. The vegetation stem diameters are generally less than 7 cm (3 in.), but the stems are closely spaced. Thorny thicket areas occur. The soils are ML and CL, well drained internally and externally.[1] Only a few minor drainageways intersect the various occurrences of this map unit.	Somewhat restricted because of dense vegetation which reduces driver visibility and requires constant overriding. This is not a good area for the use of tracked vehicles.	Actual testing during a typical wet period in this map unit revealed that both the M-151 and the M-35 could travel through the area at speeds up to 15 kmph (9 mph), but the drivers reported that visibility was restricted and some minor damage occurred to both vehicles. This is a poor area for the employment of wheeled vehicles in training exercises.	Density of vegetation and presence of thorny bushes provide some hindrance to foot movement.
4	Areas of pine, hardwood, and mixed pine-hardwood forests, with medium to dense spacing (Vegetation Map Units 1, 3, and 5). The unit occurs mainly in the low plains on slopes less than about 5 percent. The soils are ML and CI, well drained internally and externally.[1] Numerous drainageways and streams intersect this map unit.	While tracked vehicles can negotiate significant portions of this unit by careful maneuvering, including backing and overriding many trees, they can only be used to a very limited extent in training exercises. The unit is therefore considered unsuited for normal tracked vehicle exercises.	Actual testing during a typical wet period revealed that the M-151 and the M-35 could, with extreme difficulty, maneuver through many portions of this unit. However, the combination of dense vegetation, large trees, irregular surface configuration, treefalls, and drainageways, renders this map unit generally unsuited for wheeled vehicles during either wet or dry periods.	Troops will be slowed somewhat by the necessity to circumnavigate trees and treefalls and cross drainageways.
5	Areas of hardwood forests with medium to dense spacing (Vegetation Map Unit 3) on steep, severely dissected ridges (Engineering Soils Map Units 1 and 7), upland terraces and foot slopes of uplands (Engineering Soils Map Unit 6), and narrow areas of nearly level floodplains bounding streams (Engineering Soils Map Unit 2). Soils are gravelly (GM) on the slopes and slope toes and ML to CL elsewhere. Soils are generally firm enough to support vehicular traffic unless they are influenced by standing water.[1] Slopes vary widely (some measured to be 55 percent) but range generally between 8 and 45 percent.	Careful selection of routes can result in an ability of tracked vehicles to negotiate the floodplains, climb the slopes, and maneuver on the ridge tops, but a practical rating, giving proper consideration to the safety of personnel and vehicles is "unsuited".	Generally, this map unit, because of the vegetation and/or configuration of the terrain, is unsuited for wheeled vehicles. However, with planning and determination certain portions can be traversed.	Foot troops can negotiate the unit, but with considerable difficulty, especially on the slopes.

[1] In general, the soils at Fort Campbell are well drained. Rain is carried away swiftly by the extensive network of drainageways and streams or it percolates quickly to layers of soil too deep to influence the movement of vehicles and troops. However, most of the soils that lie on slopes less than about five percent, i.e., most of Fort Campbell, but particularly areas in the central and southeastern portions of the installation, are underlain by a fragipan that acts as a barrier to further downward movement of water. When rainfall is prolonged and heavy, the voids of the surface soils become filled with water. Such saturated soils are highly sensitive to vehicle loadings and are generally impassable to all vehicles. Such situations may occur at any time of the year, but occur more frequently in the period between December and May. The occurrence is short-lived, usually in the order of a day or two. The situations are recognizable by standing water. In fact, standing water, regardless of the reason for its occurrence, is a clear sign of low-strength soils. Traffic should avoid such areas whenever possible. These observations apply to pertinent soils in all CCM Map Units for this installation.

*Comments apply to the M-60 tank and the M-113 armored personnel carrier (APC).
**Comments apply to the M-35, 2-1/2 ton truck and the M-151, 1/4-ton truck.

FORT CAMPBELL, KENTUCKY

TERRAIN ANALYSIS

CROSS-COUNTRY MOVEMENT

NOTE

Cross-country movement is defined as the off-road movement of military vehicles and personnel. The principal areal features that contribute to the cross-country movement rating of a terrain unit are soil type, state of ground (wet, dry, frozen), slope, vegetation, surface shape (rough, smooth, furrowed), and lakes and reservoirs. The principal linear features that affect cross-country movement are railroad and highway cuts and fills and rivers and streams. Natural and man-made features such as boulders, escarpments, and structures of all kinds also affect cross-country movement. The movement of different vehicles on the same terrain may be radically different, ranging from unable to travel for one vehicle to able to travel easily for another vehicle. The same terrain may afford different cross-country movement to the same vehicle at different times, depending, for example, on the time elapsed since the last rainfall. Driver skill and mechanical condition of the vehicle also can affect cross-country movement.

This map is primarily intended as a tool for the formulation of military stationing plans such as the relocation of a large unit or the selection of training areas. It is not intended to be the sole source for the selection of specific off-road routes for vehicles or personnel, but is a good base from which to plan additional study and ground reconnaissance for that purpose.

The data on terrain factors examined and the cross-country movement evaluations resulting were necessarily generalized to suit the scale and purpose of the map. Thus an area marked with a specific rating may contain areas, too small to be mapped, that have better or worse ratings. However, the significant occurrence of such cases is noted in the description of generalized terrain conditions.

The cross-country movement ratings were assigned on the basis of normal weather in the specified period, i.e., the ratings apply to most of the days in that period. Variations in the ratings for relatively short periods may occur from year to year or even within the same specified period because of unusual weather such as prolonged periods of drought, heavy precipitation, or freezing temperatures.

The cantonment area, including the former Clarksville Base, has been excluded from this analysis. Impact and demolition (demo) areas are included. However, these areas are normally off-limits for training purposes since unexploded munitions pose a danger to troops and vehicles.

EXPLANATION OF RATING TERMS

Good — Conditions permit free movement in any direction. Terrain will permit 12 or more passes in trace of an M-60 tank or permit at least one maneuver (starts, stops, sharp turns, or crossing of tracks) at one location.

Fair — Conditions moderately hinder progress or moderately restrict choices of direction for movement. Terrain will permit 3 to 12 passes in trace of an M-60 but maneuvering will be difficult.

Poor — Conditions severely hinder progress or greatly restrict choice of movement routes. Terrain will probably permit up to 3 passes in trace of an M-60. Very cautious driving required. Movement in trace should be avoided.

Unsuited — Conditions preclude all but local movement. Engineer work required for vehicular movement.

EXPLANATION OF DRY AND WET PERIODS

*Dry Period - The period when soil moisture is relatively low and the water table has been lowered by actively growing vegetation. In most years this period extends from April through November. Unusual climatic variations may drastically alter this time period.

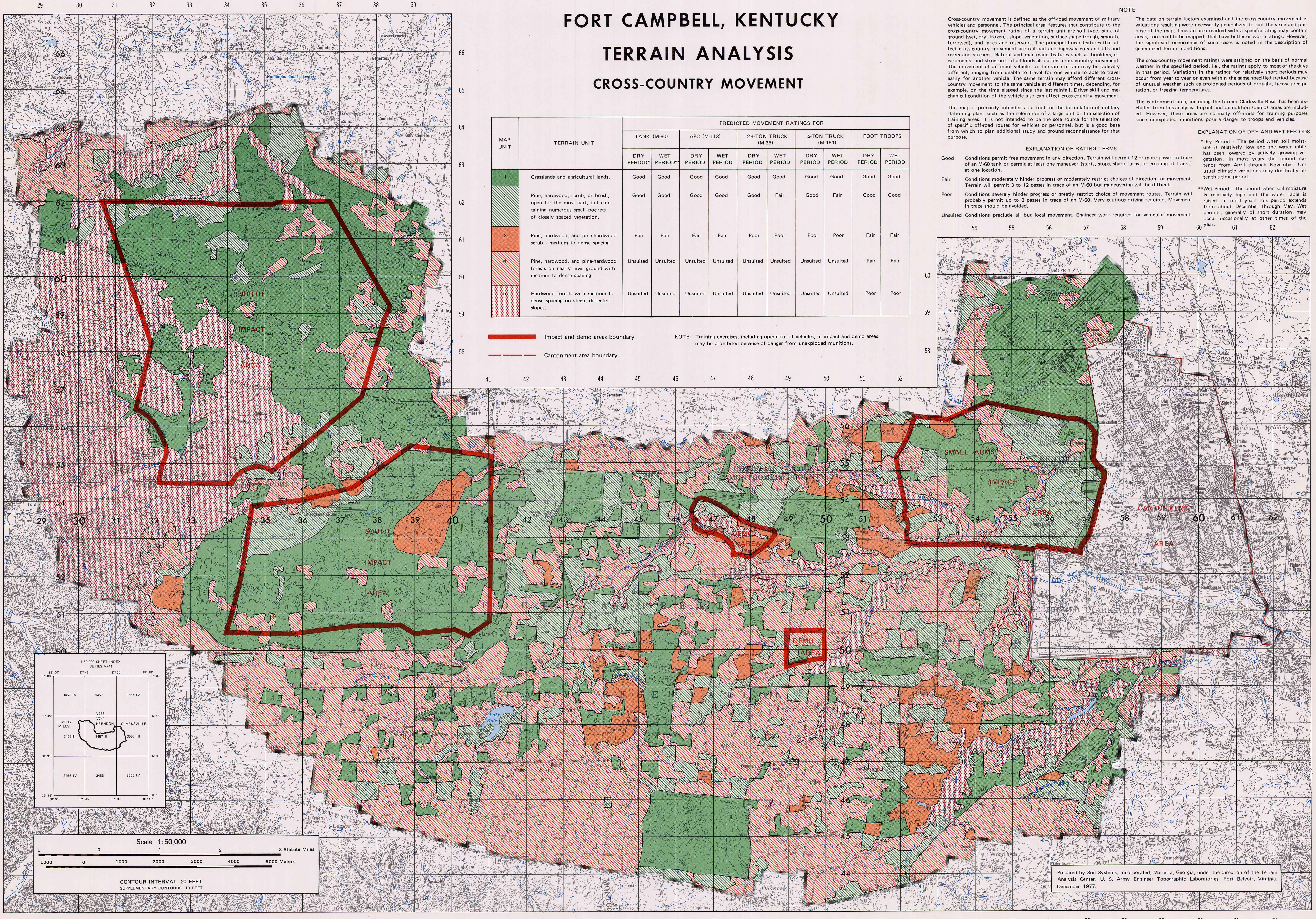
**Wet Period - The period when soil moisture is relatively high and the water table is raised. In most years this period extends from about December through May. Wet periods, generally of short duration, may occur occasionally at other times of the year.

MAP UNIT	TERRAIN UNIT	PREDICTED MOVEMENT RATINGS FOR									
		TANK (M-60)		APC (M-113)		2½-TON TRUCK (M-35)		¼-TON TRUCK (M-151)		FOOT TROOPS	
		DRY PERIOD*	WET PERIOD**	DRY PERIOD	WET PERIOD	DRY PERIOD	WET PERIOD	DRY PERIOD	WET PERIOD	DRY PERIOD	WET PERIOD
1	Grasslands and agricultural lands.	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
2	Pine, hardwood, scrub, or brush, open for the most part, but containing numerous small pockets of closely spaced vegetation.	Good	Good	Good	Good	Good	Fair	Good	Fair	Good	Good
3	Pine, hardwood, and pine-hardwood scrub - medium to dense spacing.	Fair	Fair	Fair	Fair	Poor	Poor	Poor	Poor	Fair	Fair
4	Pine, hardwood, and pine-hardwood forests on nearly level ground with medium to dense spacing.	Unsuited	Unsuited	Unsuited	Unsuited	Unsuited	Unsuited	Unsuited	Unsuited	Fair	Fair
5	Hardwood forests with medium to dense spacing on steep, dissected slopes.	Unsuited	Unsuited	Unsuited	Unsuited	Unsuited	Unsuited	Unsuited	Unsuited	Poor	Poor

Impact and demo areas boundary

Cantonment area boundary

NOTE: Training exercises, including operation of vehicles, in impact and demo areas may be prohibited because of danger from unexploded munitions.



Scale 1:50,000

1 0 1 2 3 Statute Miles

1000 0 1000 2000 3000 4000 5000 Meters

CONTOUR INTERVAL 20 FEET

SUPPLEMENTARY CONTOURS 10 FEET

Prepared by Soil Systems, Incorporated, Marietta, Georgia, under the direction of the Terrain Analysis Center, U. S. Army Engineer Topographic Laboratories, Fort Belvoir, Virginia. December 1977.

J. LINES OF COMMUNICATION

Lines of Communication (LOC) at Fort Campbell are depicted on the accompanying LOC map. Supportive information for LOC as shown on the graphic is provided in Table J-1 through J-6 following this summary. **ROADS:** The existing road network is a complex system of routes spanning a range of categories from all weather, hard surface to fair weather unimproved dirt roads. The roads shown on the map do not represent the complete network; many new minor dirt roads have not been depicted. Those that are shown in the latter category depict prevailing patterns and system connections. The length of the roads included on the map is approximately 955.4 kilometers (593.7 miles). Hard surface roads, all of which are included, total approximately 141 kilometers (87.6 miles). The length of the entire system is unknown and will vary from year to year principally due to construction of fire control roads. Refer to Table J-1, Roads, for individual road details. Data on military load classification and road shoulder characteristics were not generally available. **ROAD BRIDGES:** There are 37 bridges on Fort Campbell outside the cantonment area. Seven of these bridges are constructed of concrete and steel, the rest are timber trestle design. Bridge conditions range from excellent to very poor; the majority however, are in good condition. Table J-2, Road Bridges provides available details pertaining to each bridge. **RAILROADS:** All tracks located on Fort Campbell are federally owned and service the cantonment area. Total length is approximately 10.1 kilometers (6.3 miles) with a volume of traffic ranging from 5 to 299 cars per month. Table J-3, Railroads, provides all available information concerning railroads. **AIRFIELDS/AIRSTRIPS:** Campbell Army Airfield is the only airfield capable of handling fixed wing aircraft on the Fort Campbell installation. It has the operational capability to serve the C-141 transport. Fort Campbell is the home of the 101st Airborne Assault Division. The Sabre Army Heliport and the Campbell Army Airfield serve as the major servicing locations for the helicopters assigned to the 101st. There are an additional twelve airstrips that are used for training by the 101st Airborne Assault Division. Table J-4, Airfields/Airstrips provides available details pertaining to each airfield/airstrip. **HELICOPTER LANDING ZONES (HLZs):** There are 56 designated HLZs that are used for training in addition to the airfields and airstrips. The HLZs outside the cantonment are mostly grass surfaced. The surface of most of the HLZs in the cantonment are grass. The approach bearing into most of the HLZs is controlled by wind direction. Table J-5, Helicopter Landing Zones, provides available details pertaining to each HLZ. **DROP ZONES:** There are seven designated drop zones on Fort Campbell: Veghel, Carentan, Corregidor, Los Banos, Suckchon, Bastogne, Son. All drop zones are considered active. For additional data refer to Table J-6, Drop Zones. **FORDS:** See Table B-3 in Surface Drainage Section.

TABLE J-1

ROADS

ROUTE NAME	GRID REFERENCE FROM	GRID REFERENCE TO	LENGTH OF SEGMENT	MILITARY LOAD CLASSIFICATION	ROUTE TYPE	SURFACE CONSTRUCTION MATERIALS	SURFACE WIDTH/CONDITION	SHOULDERS CONSTRUCTION MATERIALS	SHOULDERS WIDTH/CONDITION	REMARKS
Angels Road	38735535	51056820	19.3 km (12.0 mi)	No Data	All weather	Bituminous concrete	6.6 m (21.6 ft); good	Crushed stone	.3 m (.98 ft); fair	
Artillery Road	28955405	40395649	12.5 km (7.8 mi)	No Data	All weather	Bituminous concrete	5.8 m (19.0 ft); good	Crushed stone	.3 m (.98 ft); fair	
Big Rock Road	33855015	34655378	3.5 km (2.2 mi)	No Data	All weather	Crushed stone	6.3 m (20.7 ft); good	Dirt	No Data	
Boiling Springs Road										
Segment 1	53695285	54304942	3.2 km (1.98 mi)	No Data	All weather	Bituminous concrete	6.0 m (19.7 ft); good	Crushed stone	.45 m (1.5 ft); poor	
Segment 2	54304942	54464487	4.8 km (3.0 mi)	No Data	All weather	Crushed stone	6.0 m (19.7 ft); good	Dirt	No Data	
Buckner Trail	31635380	32755105	3.1 km (1.9 mi)	No Data	All weather	Crushed stone	5.8 m (19.0 ft); fair to good	Dirt	No Data	
California	58505140	58404980	1.5 km (.9 mi)	No Data	All weather	Bituminous concrete	6.8 m (22.3 ft); fair	Crushed stone	.3 m (.98 ft); fair	
Caudle Road	37905980	39306030	2.5 km (1.5 mi)	No Data	All weather	Crushed stone	5.0 m (16.4 ft); fair	Dirt	No Data	
Centerline Road	47954495	53094517	5.0 km (3.1 mi)	No Data	All weather	Bituminous concrete	6.9 m (22.6 ft); good	Unknown	No Data	
Chaffe Road	60005478	60855531	.75 km (.5 mi)	No Data	All weather	Bituminous concrete	14 m (45.9 ft); good	Crushed stone	.6 m (1.9 ft); good	
Engineers Road	46605400	47655195	2.5 km (1.6 mi)	No Data	All weather	Crushed stone	5.8 m (19.0 ft); good	Dirt	No Data	
Garrettsburg Road	50625475	50795700	1.0 km (.6 mi)	No Data	All weather	Crushed stone	4.3 m (14.1 ft); good	Dirt	No Data	
Ghost Corps Trail	47755219	52905019	5.75 km (3.6 mi)	No Data	All weather	Crushed stone	6.0 m (19.7 ft); good	Dirt	No Data	
Grant Road	43065475	43005010	5.0 km (3.1 mi)	No Data	All weather	Bituminous concrete	6.3 m (20.7 ft); good	No Data	No Data	
Helicat Trail	50454980	54224856	4.5 km (2.8 mi)	No Data	All weather	Crushed stone	6.0 m (19.7 ft); good	Dirt	No Data	
Indian Mound Road	40374475	42065025	6.0 km (3.7 mi)	No Data	All weather	Crushed stone	6.0 m (19.7 ft); good	Dirt	No Data	
Indiana	60255235	57855790	6.0 km (3.7 mi)	No Data	All weather	Bituminous concrete	7.0 m (23.0 ft); good	Crushed stone	.3 m (.98 ft); good	
Jordan Springs Road										
Segment 1	29255409	37484986	11.3 km (7.0 mi)	No Data	All weather	Crushed stone	6.7 m (22.0 ft); good	Dirt	No Data	
Segment 2	37484986	58674973	22.5 km (14.0 mi)	No Data	All weather	Bituminous concrete	6.7 m (22.0 ft); good	Crushed stone	.6 m (1.96 ft); poor	
Killebrew Road	41145570	41595033	5.0 km (3.1 mi)	No Data	All weather	Crushed stone	5.0 m (16.4 ft); good	Dirt	No Data	
Mabry Road	45435475	60005228	15.0 km (9.3 mi)	No Data	All weather	Bituminous concrete	7.2 m (23.6 ft); good	Crushed stone	.3 m (.98 ft); good	
McNair Road	55605270	57244970	3.0 km (1.86 mi)	No Data	All weather	Crushed stone	4.3 m (14.1 ft); No Data	Dirt	No Data	
Missouri	59555215	57205761	5.6 km (3.5 mi)	No Data	All weather	Bituminous concrete	7.0 m (23.0 ft); good	Crushed stone	.6 m (1.96 ft); good	
New Providence Road	56504408	58284765	2.5 km (1.5 mi)	No Data	All weather	Bituminous concrete	7.0 m (23.0 ft); good	Crushed stone	.46 m (1.5 ft); good	
Unnamed Road	52555049	54055164	2.0 km (1.2 mi)	No Data	All weather	Bituminous concrete	6.5 m (21.3 ft); good	No Data	No Data	
Unnamed Road	54184810	56204845	2.1 km (1.3 mi)	No Data	All weather	Crushed stone	5.0 m (16.4 ft); No Data	No Data	No Data	
Unnamed Road	49955295	50455150	1.8 km (1.1 mi)	No Data	All weather	Crushed stone	No Data	No Data	No Data	
Unnamed Road	47305525	47685347	2.6 km (1.6 mi)	No Data	All weather	Crushed stone	No Data	No Data	No Data	
Unnamed Road	41505240	42955228	1.5 km (.93 mi)	No Data	All weather	Crushed stone	No Data	No Data	No Data	
Unnamed Road	41555392	42755360	1.3 km (.81 mi)	No Data	All weather	Crushed stone	No Data	No Data	No Data	
Unnamed Road	41205445	41645484	.6 km (.4 mi)	No Data	All weather	Crushed stone	No Data	No Data	No Data	
Unnamed Road	32855195	33445320	1.5 km (.9 mi)	No Data	All weather	Crushed stone	No Data	No Data	No Data	
Unnamed Road	34805380	35075455	.8 km (.5 mi)	No Data	All weather	Crushed stone	No Data	No Data	No Data	
Unnamed Road	36665415	37655684	3.4 km (2.1 mi)	No Data	All weather	Crushed stone	No Data	No Data	No Data	
Unnamed Road	37156175	37506235	.7 km (.4 mi)	No Data	All weather	Crushed stone	No Data	No Data	No Data	
Unnamed Road	30296225	31056195	.8 km (.5 mi)	No Data	All weather	Crushed stone	No Data	No Data	No Data	
Unnamed Road	29366103	30686371	3.1 km (1.9 mi)	No Data	All weather	Crushed stone	No Data	No Data	No Data	
Unnamed Road	28705663	29305685	.6 km (.4 mi)	No Data	All weather	Crushed stone	No Data	No Data	No Data	
Unnamed Road	40534964	40615030	.7 km (.4 mi)	No Data	All weather	Crushed stone	No Data	No Data	No Data	
Normandy Loop	37004705	37595070	4.0 km (2.5 mi)	No Data	All weather; Limited traffic	Crushed stone	4.0 m (13.1 ft); fair to poor	Dirt	No Data	
Ohio Road	55605140	59705120	5.0 km (3.1 mi)	No Data	All weather	Bituminous concrete	6.8 m (22.3 ft); good	Crushed stone	.3 m (.98 ft); fair	
On the Line Road	52175293	52355620	3.5 km (2.2 mi)	No Data	All weather	Bituminous concrete	6.8 m (22.3 ft); good	Crushed stone	.3 m (.98 ft); fair	
Oriental Village Road	53354540	52354880	4.0 km (2.5 mi)	No Data	All weather	Crushed stone	No Data	Dirt	No Data	
Palmyra Road	47864341	50795617	13.75 km (8.5 mi)	No Data	All weather	Bituminous concrete	6.2 m (20.3 ft); good	No Data	No Data	
Park Town Road	38755038	40384953	2.0 km (1.2 mi)	No Data	All weather	Crushed stone	5.0 m (16.4 ft); good	Dirt	No Data	
Patton Road	35556435	39895615	12.9 km (8.0 mi)	No Data	All weather	Crushed stone	5.8 m (19.0 ft); good	Dirt	No Data	
Perimeter Road	30055440	35556435	14.5 km (9.0 mi)	No Data	All weather	Crushed stone	6.0 (19.7 ft); good	Dirt	No Data	
Pleasant Mill Road	48154655	52154735	3.75 km (2.33 mi)	No Data	Fair weather	Improved dirt	6.5 m (21.3 ft); good	No Data	No Data	
Pryor Trail	30755565	29955922	5.0 km (3.1 mi)	No Data	All weather	Crushed stone	5.0 m (16.4 ft); good	Dirt	No Data	
Range Road	56765255	57265634	3.2 km (2.0 mi)	No Data	All weather	Bituminous concrete	6.8 m (22.3 ft); good	Crushed stone	.3 m (.98 ft); fair	
Red Diamond Road										
Segment 1	29056110	32905987	4.2 km (2.6 mi)	No Data	All weather	Crushed stone	5.0 m (16.4 ft); good	Dirt	No Data	
Segment 2	37655685	39595665	1.9 km (1.2 mi)	No Data	All weather	Crushed stone	5.0 m (16.4 ft); good	Dirt	No Data	
Rendevous Road	40404950	41034695	2.5 km (1.6 mi)	No Data	All weather	Crushed stone	4.8 m (15.7 ft); good	Dirt	No Data	
Roaring Spring Road	35306190	36106347	1.9 km (1.2 mi)	No Data	All weather	Crushed stone	No Data	No Data	No Data	
Rock Road	55504928	55514967	.5 km (.3 mi)	No Data	All weather	Crushed stone	5.2 m (17.1 ft); good	Dirt	No Data	
Rose Hill Road	44354990	47705218	5.0 km (3.1 mi)	No Data	All weather	Crushed stone	6.0 m (19.7 ft); good	Dirt	No Data	
Spangler Loop	56134910	57004770	1.5 km (.9 mi)	No Data	All weather	Crushed stone	5.0 m (16.4 ft); good	Dirt	No Data	
Stampers Chapel Road	37554795	40944738	3.5 km (2.2 mi)	No Data	All weather	Crushed stone	No Data	Dirt	No Data	
Suckchon Road	41034695	47804600	7.0 km (4.3 mi)	No Data	All weather	Crushed stone	No Data	Dirt	No Data	
Walker Road	42245022	43055203	2.5 km (1.5 mi)	No Data	All weather	Crushed stone	5.6 m (18.4 ft); fair	Dirt	No Data	Needs new stone
Woodlawn Road	52404375	59905224	12.5 km (7.8 mi)	No Data	All weather	Bituminous concrete	6.8 m (22.3 ft); good	Crushed stone	.3 m (.98 ft); fair	
25th Street	57555470	60005478	2.5 km (1.6 mi)	No Data	All weather	Bituminous concrete	7.0 (23.0 ft); good	Crushed stone	.3 m (.98 ft); good	
			TOTAL LENGTH (APPROXIMATE)							
Unimproved Dirt Roads			663 km (412 mi)							

NOTE: Eight digit grid coordinates were used to increase the accuracy of some locations.

J. LINES OF COMMUNICATION (Continued)

TABLE J-2

ROAD BRIDGES

BRIDGE NUMBER	ROUTE DESIGNATION	GRID* REFERENCE	FEATURE CROSSED	MILITARY LOAD CLASSIFICATION	DIMENSIONS**	CLEARANCE	TYPE/CONSTRUCTION MATERIAL	CONDITION	REMARKS
1	Perimeter Road	345643	Casey Creek	60	Length: 21.2 m (69.6 ft) Width: 4.1 m (13.4 ft)	Vertical: Unlimited Horizontal: No Data	Timber trestle	Good	Bypass easy
2	Perimeter Road	311629	Intermittent stream	5	Length: 10.9 m (36 ft) Width: 4.4 m (14.5 ft)	Vertical: Unlimited Horizontal: No Data	Timber trestle	No Data	Bypass difficult
3	Perimeter Road	300617	Intermittent stream	50	Length: 7.6 m (25 ft) Width: 7.6 m (25 ft)	Vertical: Unlimited Horizontal: No Data	Timber trestle	Good	
4	Perimeter Road	308569	Dry Fork Creek	18/5	Length: 13.9 m (45.8 ft) Width: 4.0 m (13.3 ft)	Vertical: Unlimited Horizontal: No Data	Timber trestle	No Data	
5	Unnamed dirt road	527457	Intermittent stream	No Data	Length: 3.0 m (10 ft) Width: 2.4 m (8 ft)	Vertical: Unlimited Horizontal: No Data	Timber trestle	No Data	
6	Pryor Trail	303556	Intermittent stream	No Data	Length: No Data Width: No Data	Vertical: Unlimited Horizontal: No Data	1.8 m (6 ft) diameter culvert	No Data	
7	Jordan Springs Road	294537	Saline Creek	30	Length: 32.4 m (106.3 ft) Width: 6.98 m (22.9 ft)	Vertical: Unlimited Horizontal: No Data	Timber trestle	No Data	Bypass easy
8	Artillery Road	309543	Saline Creek	60	Length: 29.7 m (97.5 ft) Width: 7.0 m (23 ft)	Vertical: Unlimited Horizontal: No Data	Timber trestle	Good	Bypass easy
9	Artillery Road	323539	Intermittent stream	16	Length: 10.9 m (36 ft) Width: 7.6 m (24.8 ft)	Vertical: Unlimited Horizontal: No Data	Timber trestle	No Data	Bypass easy
10	Rendevous Road	405492	Piney Fork Creek	7	Length: 15.3 m (50.25 ft) Width: 4.5 m (14.7 ft)	Vertical: Unlimited Horizontal: No Data	Timber trestle	Good	
11	Walker Road	426512	Intermittent stream	8	Length: 3.1 m (10.25 ft) Width: 3.4 m (11.2 ft)	Vertical: Unlimited Horizontal: No Data	Timber trestle	No Data	
12	Engineers Road	466534	Piney Fork Creek	5	Length: 32.4 m (106.3 ft) Width: 3.3 m (10.8 ft)	Vertical: Unlimited Horizontal: No Data	Timber trestle	Good	
13	Ghost Corps Trail	483520	Little Creek	24	Length 8.1m (26.6 ft) Width: 4.3 m (14.2 ft)	Vertical: Unlimited Horizontal: No Data	Timber trestle	Good	Bypass impossible
14	Ghost Corps Trail	515514	Jordan Creek	100/60	Length: 22.9 m (75 ft) Width: 7.3 m (24 ft)	Vertical: Unlimited Horizontal: No Data	Concrete/steel	Excellent	Bypass easy
15	Unnamed gravel road	412486	Intermittent stream	30	Length: 5.4 m (17.9 ft) Width: 3.3 m (10.9 ft)	Vertical: Unlimited Horizontal: No Data	Timber trestle	Excellent	
16	New Providence Road	583476	Intermittent stream	46/30	Length: 12.5 m (41 ft) Width: 7.0 m (23 ft)	Vertical: Unlimited Horizontal: No Data	Timber trestle	Good	Bypass difficult
17	New Providence Road	573489	Fletchers Fork	35	Length: 15.2 m (50 ft) Width: 3.2 m (10.5 ft)	Vertical: Unlimited Horizontal: No Data	Timber trestle	Good	Bypass easy
18	Spangler Loop	565479	Lake Taal	25	Length: 32.2 m (105.6 ft) Width: 3.4 m (11.3 ft)	Vertical: Unlimited Horizontal: No Data	Timber trestle	Very poor	Needs extensive work throughout
19	Boiling Springs Road	542475	Unnamed stream	30	Length: 18.3 m (60 ft) Width: 3.0 m (10 ft)	Vertical: Unlimited Horizontal: No Data	Timber trestle	Good	Bypass difficult
20	Oriental Village Road	532457	Intermittent stream	18	Length: 18.3 m (60 ft) Width: 2.5 m (8.3 ft)	Vertical: Unlimited Horizontal: No Data	Timber trestle	Fair to Poor	Bypass easy needs new handrails
21	Centerline Road	525450	Intermittent stream	60	Length: 19.5 m (64 ft) Width: 7.9 m (26 ft)	Vertical: Unlimited Horizontal: No Data	Concrete/steel	Good	Bypass easy
22	Pleasant Mill Road	512474	Intermittent stream	30	Length: 8.6 m (28.4 ft) Width: 3.0 m (10 ft)	Vertical: Unlimited Horizontal: No Data	Timber trestle	Fair	Bypass easy
23	Unnamed road	494506	Intermittent stream	40	Length: 11.6 m (38 ft) Width: 3.2 m (10.6 ft)	Vertical: Unlimited Horizontal: No Data	Timber trestle	Good	Bypass easy
24	Palmyra Road	502547	Dry Creek	100/30	Length: 27.4 m (90 ft) Width: 7.2 m (23.8 ft)	Vertical: Unlimited Horizontal: No Data	Concrete/steel	Good	Bypass difficult
25	On The Line Road	521541	Dry Creek	60/30	Length: 18 m (59 ft) Width: 7.2 m (23.5 ft)	Vertical: Unlimited Horizontal: No Data	Timber trestle	Good	
26	Boiling Springs Road	540523	Piney Fork Creek	60	Length: 39.7 m (130.4 ft) Width: 6.97 m (22.9 ft)	Vertical: Unlimited Horizontal: No Data	Timber trestle	Excellent	Bypass easy
27	Palmyra Road	480526	Piney Fork Creek	100	Length: 27.1 m (89 ft) Width: 12.8 m (42 ft)	Vertical: Unlimited Horizontal: No Data	Concrete/steel	Excellent	Bypass difficult
28	Unnamed road	368484	Intermittent stream	30	Length: No Data Width: No Data	Vertical: Unlimited Horizontal: No Data	No Data	No Data	
29	Indian Mound Road	422493	Piney Fork Creek	100/30	Length: 23.6 m (77.4 ft) Width: 7.3 m (23.9 ft)	Vertical: Unlimited Horizontal: No Data	Concrete/steel	Excellent	
30	Suckchon Road	446468	Intermittent stream	50	Length: No Data Width: No Data	Vertical: Unlimited Horizontal: No Data	No Data	No Data	
31	Woodlawn Road	59845124	Little West Fork Creek	No Data	Length: 33.9 m (111 ft) Width: 8.4 m (27.7 ft)	Vertical: Unlimited Horizontal: No Data	Concrete	No Data	
32	No Data	59765124	Little West Fork Creek	No Data	Length: 84.4 m (277 ft) Width: 6.35 m (20.8 ft)	Vertical: Unlimited Horizontal: No Data	No Data	No Data	Located on old Clarksville Base perimeter road
33	No Data	59755124	Little West Fork Creek	No Data	Length: 84.4 m (277 ft) Width: 6.35 m (20.8 ft)	Vertical: Unlimited Horizontal: No Data	No Data	No Data	Located on old Clarksville Base perimeter road
34	No Data	57955157	Little West Fork Creek	No Data	Length: 101.3 m (332.4 ft) Width: 8.4 m (27.7 ft)	Vertical: Unlimited Horizontal: No Data	Concrete	No Data	
35	No Data	55665186	Little West Fork Creek	No Data	Length: 25.3 m (83.1 ft) Width: 7.6 m (25 ft)	Vertical: Unlimited Horizontal: No Data	No Data	No Data	Located on old Clarksville Base perimeter road
36	No Data	55615187	Little West Fork Creek	No Data	Length: 185.7m (609.4 ft) Width: 17.7 m (58.7 ft)	Vertical: Unlimited Horizontal: No Data	No Data	No Data	Located on old Clarksville Base perimeter road
37	McNair Road	55535190	Little West Fork Creek	No Data	Length: 42.2 m (138 ft) Width: 4.22 m (13.85 ft)	Vertical: Unlimited Horizontal: No Data	No Data	No Data	

* Eight digit grid coordinates were used to increase the accuracy of some locations.
** Roadway widths not available.

TABLE J-3

RAILROADS

IDENTIFICATION NUMBER	SEGMENT OF TRACK (GRID REFERENCE) FROM	TO	LENGTH OF SEGMENT	OWNERSHIP OF LINE AND CONDITION OF TRACK	CHARACTERISTICS OF TRACK	CROSS-OVER LOCATIONS	SIDINGS	BALLAST MATERIAL	VOLUME OF TRAFFIC	FACILITIES	REMARKS
Line 1	590517	602521	1 km (.62 mi)	U.S. Army	Standard gage single track, 45.3 kg/m (100 lbs/yd)	None	No Data	Crushed stone	5-24 cars/month	No Data	Services old Clarksville Base
Line 2	613526	562576	7.5 km (4.7 mi)	U.S. Army	Standard gage single track, 31.75 kg/m (70 lbs/yd)	None	Six sidings servicing warehouse facilities between 592527, 595521 and 562576, 564574	Crushed stone	100-299 cars/month	No Data	Services Campbell Army Airfield
Line 3	613526	606542	1.6 km (.99 mi)	U.S. Army	Standard gage single track, 31,75 kg/m (70 lbs/yd)	None	Five sidings servicing warehouse facilities between 609530 and 607543	Crushed stone	100-299 cars/month	No Data	Services Facility Engineering Complex

TABLE J-4
AIRFIELDS/AIRSTRIPS

MAP NUMBER/NAME GRID REFERENCE; TYPE; CLASSIFICATION	ELEVATION/ STATUS	RUNWAY DESCRIPTION	TAXIWAY, PARKING, APRON, HARDSTAND AREA DESCRIPTION	BUILDING DESCRIPTION	POL FACILITIES	NAVIGATIONAL AIDS	REMARKS
1–Campbell Army Airfield; 560581 Airfield Army	174 m (572 ft) Operational	Runway 1: 3610 m long x 80 m wide (11843.8 x 262 ft); azimuth: 037°–217°; maximum weight bearing capacity: S 100, T 190, ST 175, TT 310; concrete/good. Runway 2: 822 m long x 46 m wide (2696 x 150.9 ft); azimuth: 016°–196°; maximum weight bearing capacity: ST 175 lbs; macadam/good.	Taxiway: 23m (75 ft) wide Asphalt Aprons: 483, 978.4 m^2 (5,209,500 ft^2) Hardstand: 20615.2 m^2 (221,900 ft^2)	Hangers: 11 Dimensions: No Data Material: Metal and Block Shops: 11 Administration Building: 822.6 m^3(8,855 ft^2)	Fuel: Jet–JP4 Aviation gas–100/+30 Dispensing Facilities: trucks, tanks above & below ground serviced by pipeline Capacities: No Data	Control Towers (2) Height 37 m (120 ft) 15.2 m (50 ft) TWR APP/CONT Non Directional Beacon ILS ASR A/G PAR	
2–522454 Army Airstrip	185.9 m (610 ft) Operational	740 m long x 50 m wide (2427.8 x 164 ft); azimuth: 065°–245°; weight bearing capacity: No data; turf.	None	None	None	None	
3–448510 Airstrip Army	182.8 m (600 ft) Operational	675 m long x 50 m wide (2214 x 164 ft); azimuth: 350°–170°; weight bearing capacity: No data; turf.	None	None	None	None	
4–517467 Airstrip Army	198 m (650 ft) Operational	500 m long x 50 m wide (1640 x 164 ft); azimuth: 340°–160°; weight bearing capacity: No data; turf.	None	None	None	None	
5–475539 Airstrip Army	170.7 m (560 ft) Operational	1220 m long x 50 m wide (4002.6 x 164 ft); azimuth: 095°–275°; weight bearing capacity: No data; turf.	None	None	None	None	
6–445495 Airstrip Army	181.3 m (595 ft) Operational	540 m long x 50 m wide (1771 x 164 ft); azimuth: 095°–275°; weight bearing capacity: No data; turf.	None	None	None	None	
7–Indian Mound Landing Zone 425516 Airstrip Army	179.8 m (590 ft) Operational	2) 820 m long x 50 m wide (2690.3 x 164 ft); azimuth: 092°–272°; weight bearing capacity: No data; turf.	None	None	None	None	
8–409506 Airstrip Army	182.8 m (600 ft) Operational	840 m long x 60 m wide (2755.9 x 197 ft); azimuth: 055°–235°; weight bearing capacity: No data; turf.	None	None	None	None	
9–395483 Airstrip Army	182.8 m (600 ft) Operational	650 m long x 40 m wide (2132.5 x 131.2 ft); azimuth: 070°–250°; weight bearing capacity: No data; turf.	None	None	None	None	
10–370537 Airstrip Army	167.6 m (550 ft) Operational	2) 1400 m long x 40 m wide (4593 x 131 ft); azimuth: 090°–270°; weight bearing capacity: No data; turf.	None	None	None	None	Located in South Impact Area
11–343498 Airstrip Army	192 m (630 ft) Operational	2) 940 m long x 40 m wide (3083 x 131 ft); azimuth: 090°–270°; weight bearing capacity: No data; turf.	None	None	None	None	
12–343628 Airstrip Army	158 m (520 ft) Operational	800 m long x 50 m wide (2624.7 x 164 ft); azimuth: 355°–175°; weight bearing capacity: No data; turf.	None	None	None	None	
13–LZ Emergency 303542 Airstrip Army	140 m (460 ft) Operational	800 m long x 40 m wide (2624.7 x 131.2 ft); azimuth: 065°–245°; weight bearing capacity: No data; turf.	None	None	None	None	
14–Sabre Army Heliport 569472 Airfield Army	177 m (581 ft) Operational	701 m long x 12 m wide (2300 x 40 ft); azimuth: 042°–222°; rotary aircraft only; concrete/good.	Taxiway: No data	Hanger: 1 Dimensions: No data Material: Metal and Block Shops and Administration Building contained in hanger	Fuel: Jet–JP4 Dispensing Facilities: Temporary tank 180,000 gal.	Control Tower No data VOR Runways lighted for rotary craft	

NOTE: Runway weight bearing capacity in pounds (gross weight of aircraft) is determined by adding 000 to figure following S, T, ST, TT. Runway weight bearing capacity given is for unlimited operations. Aircraft weight higher than given requires prior permission from aerodrome controlling authority.
- S - Runway weight bearing capacity for aircraft with single-wheel type landing gear (C-47, F100).
- T - Runway weight bearing capacity for aircraft with twin-wheel type landing gear (C-9A).
- ST - Runway weight bearing capacity for aircraft with single-tandem landing gear (C-130).
- TT - Runway weight bearing capacity for aircraft with twin-tandem type (includes quadricycle) landing gear (B-52, C-135).

For further information, see DOD Flight Information Publication (enroute IFR-Supplement United States).

TABLE J-5
HELICOPTER LANDING ZONES

MAP NUMBER AND NAME	GRID REFERENCE	DIMENSIONS	AZIMUTH	ELEVATION	SURFACE MATERIAL	RESTRAINTS	REMARKS
1/1-W-12	477491	198 x 189 m (650 x 620 ft)	090°-270°	182.9 m (600 ft)	Loam soil, grass, scattered trees	No Data	
2/1-W-11	509454	304.8 x 280 m (1000 x 920 ft)	000°-180°	185.2 m (610 ft)	Tall weeds and grass	Northeast portion of HLZ has trees approximately 18.3 m (60 ft) tall	
3/1-W-10	530470	578 x 250 m (1700 x 820 ft)	090°-270°	182.9 m (600 ft)	Broom-Straw, shrubs, small trees	East portion has several shallow foxholes	Terrain is rolling and hilly
4/1-W-9	519474	304.8 x 228.6 m (1000 x 750 ft)	000°-180°	184.m (605 ft)	Broom-Straw, shrubs, trees to 12.2 m (40 ft) tall	Family cemetery just inside north boundary in clump of trees	
5/1-W-8	522474	305.5 x 250 m (1150 x 820 ft)	090°-270°	182.9 m (600 ft)	Broom-Straw, small shrubs	No Data	
6/1-W-7	509472	289.6 x 152.4 m (950 x 500 ft)	090°-270°	185.2 m (610 ft)	Broom-Straw, small shrubs	No Data	Slope uphill from south to north
7/1-W-6	495494	188.9 x 115.8 m (620 x 380 ft)	090°-270°	176.8 m (580 ft)	Broom-Straw, scattered brush	No Data	
8/1-W-4	489493	205.7 x 137 m (675 x 450 ft)	045°-225°	173.7 m (570 ft)	Broom-Straw, numerous trees to 3.0 m (10 ft) high	No Data	
9/1-W-3	488486	131 x 85.3 m (430 x 280 ft)	000°-180°	173.7 m (570 ft)	Broom-Straw, scattered brush, small trees to 6.1 m (20 ft) high	No Data	Rolling terrain
10/1-W-2	484489	268.2 x 152.4 m (880 x 500 ft)	090°-270°	181.3 m (595 ft)	Broom-Straw, small shrubs	No Data	
11/1-W-1	483519	152 x 115.8 m (500 x 380 ft)	000°-180°	152.4 m (500 ft)	Broom-Straw, small trees	No Data	Terrain is hilly running from northeast to southwest
12/1-V-14	442483	304.8 x 100.6 m (1000 x 330 ft)	090°-270°	182.9 m (600 ft)	Broom-Straw, group of trees in upper north center of HLZ	No Data	
13/1-V-13	403457	152.4 x 115.8 m (500 x 380 ft)	090°-270°	192.0 m (630 ft)	Grass	No Data	Slight slope to west
14/1-V-12	406470	207.3 x 207.3 m (680 x 680 ft)	000°-180°	192.0 m (630 ft)	Broom-Straw, numerous scattered trees	No Data	Slight slope to west
15/1-V-11	392473	268.2 x 185.9 m (880 x 610 ft)	000°-180°	185.9 m (610 ft)	No Data	No Data	
16/1-V-10	392478	248.4 x 185.9 m (815 x 610 ft)	090°-270°	185.9 m (610 ft)	Broom-Straw	No Data	
17/1-V-9	467472	335.3 x 76.2 m (1100 x 250 ft)	090°-270°	201.2 m (660 ft)	Broom-Straw with scattered trees	No Data	Gentle slope north to south
18/1-V-8	446485	350.5 x 100.6 m (1150 x 330 ft)	045°-225°	184.4 m (605 ft)	Broom-Straw, scattered brush, and small trees	No Data	Gentle slope south to north
19/1-V-7	427533	731.5 x 365.8 m (2400 x 1200 ft)	000°-180°	184.4 m (605 ft)	Broom-Straw and brush	No Data	Northern half level, southern half gentle slope running north
20/1-V-6	381492	243.8 x 176.7 m (800 x 580 ft)	090°-270°	181.3 m (595 ft)	No Data	No Data	
21/1-V-5	422506	563.9 x 365.8 m (1850 x 1200 ft)	No Data	182.9 m (600 ft)	Corn stubble	No Data	Fairly level
22/1-V-4	454519	518.2 x 167.6 m (1700 x 550 ft)	090°-270°	170.7 m (560 ft)	Corn stubble	No Data	Gently rolling
23/1-V-3	433528	457.2 x 213.4 m (1500 x 700 ft)	090°-270°	179.8 m (590 ft)	No Data	No Data	Divided by tree line running east to west
24/1-V-2	422529	350 x 274.3 m (1150 x 900 ft)	No Data	179.8 m (590 ft)	No Data	No Data	

TABLE J-5 (CONTINUED)

HELICOPTER LANDING ZONES

MAP NUMBER AND NAME	GRID REFERENCE	DIMENSIONS	AZIMUTH	ELEVATION	SURFACE MATERIAL	RESTRAINTS	REMARKS
25/1-U-5	354485	411.5 x 268.2 m (1350 x 880 ft)	090°-270°	182.9 m (600 ft)	Broom-Straw, numerous scattered trees to 7.6 m (25 ft) high	No Data	Terrain fairly level
26/1-U-3	355495	427.4 x 365.8 m (1550 x 1200 ft)	000°-180°	192.0 m (630 ft)	No Data	Scattered trees	
27/1-U-2	350501	289.6 x 152.4 m (950 x 500 ft)	090°-270°	192.0 m (630 ft)	No Data	Scattered trees up to 15.2 m (50 ft) high	
28/1-U-1	377491	268.2 x 167.6 m (880 x 550 ft)	000°-180°	182.9 m (600 ft)	Broom-Straw with numerous scattered trees 3.0-4.6 m (10-15 ft) high	No Data	
29/1-P-4	452536	427.4 x 365.8 m (1550 x 1200 ft)	No Data	179.8 m (590 ft)	Broom-Straw and scattered shrubs	No Data	Terrain slightly rolling
30/1-P-3	456544	365.8 x 143.2 m (1200 x 470 ft)	000°-180°	173.7 m (570 ft)	Grass and scattered shrubs	No Data	Terrain slightly rolling
31/1-P-2	463547	237.7 x 237.7 m (780 x 780 ft)	000°-180°	172.2 m (565 ft)	Broom-Straw, numerous shrubs and small trees	No Data	
32/1-P-1	428547	292.6 x 109.7 m (960 x 360 ft)	090°-270°	167.6 m (550 ft)	Grass	No Data	Terrain gently rolling
33/1-O-6	311558	144.8 x 121.9 m (475 x 400 ft)	000°-180°	176.8 m (580 ft)	Small trees and shrubs	No Data	
34/1-O-5	325625	152.4 x 97.5 m (500 x 320 ft)	090°-270°	182.9 m (600 ft)	Small trees and shrubs	No Data	
35/1-O-4	332626	152.4 x 91.4 m (500 x 300 ft)	000°-180°	176.8 m (580 ft)	Broom-Straw, groups of trees up to 10.7 m (35 ft) high	No Data	No access roads to HLZ
36/1-O-3	345626	213.4 x 140.2 m (700 x 460 ft)	090°-270°	164.6 m (540 ft)	Broom-Straw, with scattered groups of shrubs and trees	No Data	
37/1-O-2	338633	198.1 x 112.8 m (750 x 300 ft)	090°-270°	158.5 m (520 ft)	Broom-Straw with numerous small shrubs	No Data	Sloping towards the east
38/1-O-1	347645	228.6 x 91.4 m (750 x 300 ft)	000°-180°	152.4 m (500 ft)	Shrubs and small trees	Large area of medium-sized trees in center of HLZ	
39/1-Q-4	473546	426.7 x 170.7 m (1400 x 560 ft)	045°-225°	161.5 m (530 ft)	Broom-Straw and scattered brush		
40/1-Q-3	499554	442 x 158.5 m (1450 x 520 ft)	000°-180°	155.4 m (510 ft)	Corn stubble and scattered trees and shrubs		
41/1-Q-2	508551	132.6 x 89.9 m (435 x 295 ft)	090°-270°	170.7 m (560 ft)	Broom-Straw, scattered trees and shrubs		
42/1-Q-1	573558	533.4 x 249.9 m (1750 x 820 ft)	000°-180°	167.6 m (550 ft)	Corn stubble		
43/1	60105461	No Data	No Data	No Data	Grass	No Data	User: 101st Airborne Division
44/2	59305675	No Data	No Data	No Data	No Data	No Data	User: 326th Medical Battalion
45/3	58705665	No Data	No Data	No Data	No Data	No Data	User: 1st Brigade
46/4	59955392	No Data	No Data	No Data	No Data	No Data	User: 2nd Brigade
47/5	58505475	No Data	No Data	No Data	No Data	No Data	User: 3rd Brigade
48/6	58095590	No Data	No Data	No Data	No Data	No Data	User: Division Artillery
49/7	59125335	No Data	No Data	No Data	No Data	No Data	User: Division Support Command
50/8	56845260	No Data	No Data	No Data	No Data	No Data	User: 2-17th Calvary
51/9	58585380	No Data	No Data	No Data	No Data	No Data	User: Air Assault School
52/10	59255582	No Data	No Data	No Data	No Data	No Data	User: 20th Engineer Battalion Pathfinders
53/PZ-1	57505345	No Data	No Data	No Data	Grass	No Data	User: 101st Airborne Division
54/PZ-STRYKER	57405535	No Data	No Data	No Data	Grass	No Data	User: 101st Airborne Division
55/SON-DZ	56505660	No Data	No Data	167.6 m (550 ft)	Grass	No Data	User: 101st Airborne Division
56/Sabre Army Heliport	569472	701 x 12 m (2300 x 40 ft)	042°-222°	177 m (581 ft)	Concrete	No Data	

NOTE: Eight digit grid reference coordinates were used to increase the accuracy of some locations.

TABLE J-6

DROP ZONES

MAP NUMBER AND NAME	GRID REFERENCE	DIMENSIONS	AZIMUTH	ELEVATION	SURFACE DESCRIPTION	AIRCRAFT OBSTRUCTION	REMARKS
1–VEGHEL	NE 29876230 SE 29606055 SW 29006075 NW 29186240	1840 m x 820 m (6036.7 ft x 2690.2 ft)	005°-185°	201 m (659 ft)	Medium grass brushwood	None	Two roads cross DZ
2–CARENTAN	NE 34405280 SE 33485100 SW 32655140 NW 33555315	950 m x 192 m (3116.8 ft x 629.9 ft)	020°-200°	182.9 m (600 ft)	Medium grass brushwood	None	Contains intermittent streams
3–CORREGIDOR	NE 44055475 SE 44085345 SW 43105340 NW 43105475	1260 m x 1050 m (4133.8 ft x 3444.9 ft)	000°-180°	173.7 m (570 ft)	Medium grass brushwood	None	Contains intermittent streams and unimproved roads
4–LOS BANOS	NE 45905015 SE 45884775 SW 45084780 NW 45105020	8770 m x 1850 m (28772.9 ft x 6069.5 ft)	000°-180°	182.9 m (600 ft)	Medium grass brushwood	None	Contains unimproved roads and several intermittent streams
5–SUCKCHON	NE 47834600 SE 47904382 SW 44954420 NW 45304625	2840 m x 2120 m (9317.6 ft x 6955.4 ft)	100°-280°	207 m (680 ft)	Medium grass brushwood	None	Contains unimproved roads, several intermittent streams, lined with small trees
6–BASTOGNE	NE 51335400 SE 51335315 SW 48805320 NW 48905403	8860 m x 2650 m (29068 ft x 6694 ft)	091°-271°	167.6 m (550 ft)	Medium grass brushwood	None	Contains unimproved roads and trails
7–SON	NE 57155698 SE 57275635 SW 55555630 NW 55605698	1680 m x 770 m (5511.8 ft x 2526 ft)	090°-270°	167.6 m (550 ft)	Medium grass	None	None

NOTE: Eight digit grid reference coordinates were used to increase the accuracy of some locations.

FORT CAMPBELL, KENTUCKY

TERRAIN ANALYSIS

LINES OF COMMUNICATION

ROADS

- Hard surfaced road, 4 lanes
- Hard surfaced road, 2 lanes
- Improved dirt road
- Unimproved dirt road

BRIDGE DATA

(all measurements in meters)

A. Bridge number

B. One way military load classification

C. Two way military load classification

D. Roadway width

E. Length

F. Vertical clearance

∞ Unlimited vertical clearance

RAILROADS

2 Railroad - Single track, standard gage

AIRFIELDS/AIRSTRIPS

1 Airfield

13 Airstrip

HELICOPTER LANDING ZONES

H 56 Landing Zone

DROP ZONES

DZ 7 Drop Zone

Numbers refer to entries in table.

1:50,000 SHEET INDEX
SERIES V741

3457 IV | 3457 I | 3557 IV
V753
V741
BUMPUS MILLS | HERNDON | CLARKSVILLE
3457 III | 3457 II | 3557 III
3456 IV | 3456 I | 3556 IV

Scale 1:50,000

1 0 1 2 3 Statute Miles

1000 0 1000 2000 3000 4000 5000 Meters

CONTOUR INTERVAL 20 FEET
SUPPLEMENTARY CONTOURS 10 FEET

Prepared by Soil Systems, Incorporated, Marietta, Georgia, under the direction of the Terrain Analysis Center, U. S. Army Engineer Topographic Laboratories, Fort Belvoir, Virginia. December 1977.

33

K. URBAN AREAS (CANTONMENT AREA)

TROOP BILLETS

TYPE	TOTAL NUMBER	TOTAL CAPACITY	CURRENT OCCUPANCY	CONDITION
Permanent	62	9,204	7,700	Good to Excellent
Semi-Permanent	5	170	0	Poor
Temporary	186	8,128	4,086	Poor
TOTAL	253	17,502	11,786	

REMARKS

Data on capacity includes all facilities existing as of April 1977. All temporary facilities are scheduled for demolition by 1981. Permanent units classified as inadequate are currently being modernized.

Occupancy data were provided by the utilization report for the period ending 31 January 1977. The largest number of spaces occupied during that period (1976) was 12,180.

Current plans include construction of two 1,650 man complexes by 1980. The installation master plan indicates that with the completion of currently scheduled construction and remodeling projects (through FY 1981), permanent barracks and support facilities will accommodate 14,000 men.

QUARTERS

TYPE	TOTAL NUMBER	TOTAL CAPACITY	CURRENT OCCUPANCY	CONDITION
BOQ				
Permanent	10	160	157	Good
Temporary	13	214	0	Poor
BEQ				
Permanent	2	41	41	Good
Guest Quarters				
Guest House	1	75 double rooms		
Guest Cottages	7			
Distinguished Visitor House	2			

REMARKS

All permanent-type BOQ and BEQ facilities are normally 100 percent occupied.

Temporary units are old nurses quarters which are programmed for demolition in 1977.

Current plans indicate that new facilities should be located to the south near the family housing area since existing facilities are not favorably located. Data on the scheduled time for construction of these new facilities were not available at the time this study was completed.

1980 projected BOQ-BEQ capacity, based on existing data, will be 201.

ELECTRICITY

SUBSTATION	CAPACITY	CURRENT LOAD
Ohio Avenue & 29th St.	21,000 kva	
Kansas Avenue & 11th St.	21,000 kva	
Kansas Avenue & 46th St.	18,750 kva	
Mabry Road & Clarksville Rd.	2,100 kva	
Campbell AAF	5,000 kva	
Woodlawn Rd.	7,500 kva	
TOTAL	75,350 kva	102,413,000 kw hours (1975 full year total)

REMARKS

Electric power is provided by Tennessee Valley Authority from the 67 kva Edgoten Substation east of U.S. 41A. Existing substations owned by Ft. Campbell step the 67 kva system down to 12.5 kva. Three new substations which would increase total substation capacity to 105,350 kva will be needed to meet projected 1985 demand. Expansion of the distribution system will be necessary to serve proposed housing areas. No data were available on the expected system capacity for 1980.

The ratio of demands for the peak cooling month to peak heating month (August to January, respectively), is 1.6 to 1.0. With projected decrease in gas heating and increase electric heating in new housing, this ratio will decrease to approximately 1.1 to 1.0.

The chief problem in the existing system is its single point feed. TVA has indicated that the costs for providing an alternate feed point are prohibitive.

NATURAL GAS

CAPACITY	CURRENT LOAD
Natural gas is provided on a demand commodity rate schedule basis by the City of Clarksville. Pressure is reduced at the jointly owned regulating station on-post from 170 psi to about 28 psi. There is no current restriction on maximum daily use, other than restrictive rates. Capacity data were not available in terms of cubic feet from existing literature.	Maximum daily use is currently 12,000,000 cubic feet.

REMARKS

A shaving plant was constructed recently on-post that introduces a mixture of propane gas and compressed air into the system during peak demand periods.

The entire gas system is of recent construction and will meet projected future demands. New housing facilities will have electrical heating systems and, thus, not increase demand for natural gas on-post.

WATER SUPPLY

TYPE	CAPACITY	CURRENT LOAD
Supply:		
Boiling Springs	6.1 mgd	4.8 mgd. (average daily domestic water demand)
Red River	5.5 mgd	
Treatment:		
Water Treatment Plant	7.5 mgd	
Storage:	2,500,000 gallons in 5 elevated storage tanks	

REMARKS

Maximum daily demand was 6.8 mgd in 1975. Boiling Springs is the primary source with Red River serving as an emergency source with higher pollutant and turbidity levels. Existing documentation indicates that the per capita consumption rate is very high suggesting the need for conservation and the possibility that leaks exist in the distribution system.

A maximum daily consumption of 11.7 mgd has been projected for 1982 due to the expected growth of the installation population. Expansions to the existing system to meet this demand will include increasing the pumping capacity at Boiling Springs; expansion of the treatment plant; addition of a 1.0 million gallon storage tank south of Clarksville Base; and, extension of distribution mains to new housing areas. The existing and proposed distribution system will provide adequate pressures to meet domestic and fire supply demands.

SEWERAGE

PLANT AND LOCATION	CAPACITY	AVERAGE DAILY FLOW	PEAK RECORDED FLOW
Old Clarksville Base on Little West Fork Creek	4.8 mgd	1.6 mgd	11.7 mgd

REMARKS

Primary and secondary treatment is provided at the Fort Campbell plant with effluent discharged to Little West Fork Creek. Digested sludge is deposited on drying beds. There are presently 14 pumping stations, 4 of which were under construction in early 1977.

The hydraulic capacity of the plant will meet flow levels projected for 1980. Advanced treatment may be required in the future with increased biological loading. Flood protection is needed at the treatment plant. Sewer lines will need to be extended to new housing areas.

FAMILY HOUSING

AREA NAME	TOTAL BUILDINGS	TOTAL FAMILY UNITS	CATEGORY	BUILDINGS	FAMILY UNITS	YEAR OF CONSTRUCTION	TYPE OF CONSTRUCTION FUNDS
Cole Park	24	24	General	2	2	1942	Farm houses
			Colonel	22	22	1957	MCA
Drennan Park	34	55	Lt.Col/Maj	34	55	1960	Capehart
Turner Loop	35	35	Lt.Col/Maj.	35	35	1957/1958	MCA
Werner Park	254	508	CGO/WO	46	92	1953/1959	MCA
			CGO/WO	208	416	1960	Capehart
Styker Village	115	230	NCO	115	230	1960/1964	Capehart
Hammond Heights	224	673	NCO	43	311	1956/1976	MCA
			NCO	181	362	1960/1964	Capehart
Lee Village	160	1,088	NCO	160	1,088	1958	Wherry
Campbell AAF	4	6	CGO/WO	4	6	1953/1959	MCA
Gardner Hills	100	232	Lt.Col/Maj.	8	8	1957	MCA
			CGO/WO	6	12	1957	MCA
			NCO	8	56	1957	MCA
			Lt.Col/Maj.	3	6	1960	Capehart
			CGO/WO	22	44	1960	Capehart
			NCO	53	106	1960/1964	Capehart
Area II	56	100	Not designated	12	12	1976/1977	MCA
			Not designated	44	88	1976/1977	MCA
Pierce Village	315	630	NCO/Others	315	630	1976/1977	MCA
New Housing	139	570	Not designated	129	510	1977	MCA
Other Areas	3	3	General	2	2		Farm houses
			Civilian	1	1		Farm houses
Total	1,463	4,154		1,463	4,154		

REMARKS

Authorized military personnel at Fort Campbell are assigned family quarters in a variety of two, three and four bedroom units consisting of single-family, duplex and multifamily units in good to excellent condition. As of April 1977, all completed units were occupied. The tables to the left include units under construction and programmed for completion during 1977 which will generally be multiple-family units.

There has been a continual demand for family housing on-post since availability of facilities off of the installation is limited. Future plans call for increasing total units to 8,000; 2,900 to be located in the existing cantonment area and 1,000 to be located in permanent buildings as well as mobile homes in an area south of the Old Clarksville Base near Lake Taal.

No additional construction of family housing units has been scheduled before FY 1982.

TELECOMMUNICATIONS

TYPE	CAPACITY	REMARKS
Unofficial Telephone		Service provided by the South Central Bell Telephone Company.
Official Telephone:		
Main Post Telephone Exchange Type: Stromberg Carlson "XY"	86 incoming trunks 81 outgoing trunks 7 telephone operator positions 5600 lines	Service includes appx 1000 lines for residential housing, which will be served by South Central Bell System early 1978.
Community Antenna Television (CATV)	1240 outlets	Pierce Village Community
Military Amateur Radio Service (MARS)	Receive 2 Voice Ckts 1 TTY Ckts Transmit 2 Ckts (Voice or TTY)	Full operations depend on availability of operators.

SCHOOLS AND MEDICAL FACILITIES

TYPE	CAPACITY	CURRENT LOAD	REMARKS
Schools:			
Elementary (grades K-6)	2,555 in 4 schools: Barkley (K-3-6) Jackson (K-5) Lincoln (K-5) Marshall (K-5)	2,527 (April, 1977)	A temporary facility for grades 6-7 will be established at the existing hospital with a projected September, 1977 enrollment of 372. Elementary school enrollment for Fall, 1977, including this temporary facility, is projected to be 2,899.
Junior High	610 in one school	640 (April, 1977)	Total system enrollment projections for 1977-1978 is 4,049; for 1980, 4,699.
High School	415 in one school	364 (April, 1977)	
Total	3,580	3,534	It is anticipated that by 1980 it will be necessary to renovate existing buildings and build a new elementary school with a 500 student capacity, and a new high school with an 800 student capacity. Plans for this expansion were not definite at the time this study was completed.
Medical Facilities:			
Hospital	250 beds		A new 241 bed hospital is planned for construction to begin operation by 1980-1981. A helicopter landing area is provided nearby (grid reference 59305675).
Hospital Clinics	18 units		Two clinics are scheduled for expansion by 1979.
Dental Clinics	84 chairs in 5 units		One clinic will be renovated by 1979, a second clinic is scheduled for expansion in 1985. An additional clinic is funded for FY 1977, no construction date is available at this time.
Dispensaries	9 total facilities (5 temporary, 4 permanent)		Two dispensaries will be renovated in 1979; three will be demolished in 1980.

RECREATION FACILITIES

FACILITY	CAPACITY AND LIGHTING
Fryar Field/Stadium (football/track)	8,000 seats (lighted)
Perez Baseball Field	265 seats (lighted)
2 other football fields	
8 other baseball fields	unlighted
4 softball fields	lighted
10 softball fields	unlighted
19 tennis courts	unlighted
3 tennis courts	lighted
3 basketball courts	lighted
5 basketball courts	unlighted
3 volleyball courts	unlighted
1 indoor swimming pool	
5 outdoor swimming pools	
5 tot lots	
2 golf courses (1 eighteen hole, 1 nine hole)	
1 field house	
5 gymnasiums	
1 rod and gun club	
1 riding stable	
3 recreation centers	
1 teen club	
1 show center	
1 cabaret dinner theater	
1 library (1 main, 1 branch)	
1 campground	
5 parks	
1 equipment rental center	
3 arts & crafts shops	

REMARKS

Current recreational facilities are inadequate in number and type to support the assigned military units, according to recent planning reports.

Plans for Fiscal Year 1979 propose an addition of 8 multiple court areas (with tennis, basketball, volleyball, and badminton) and 9 multiple sports areas, each with 4 softball fields superimposed over a football field. All proposed facilities will be lighted.

MAIN POST

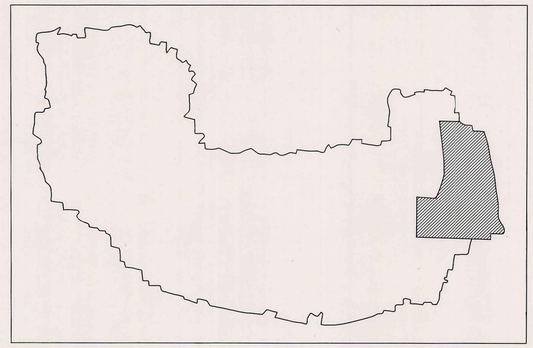
AREA FEATURES

- Family Housing, Officer/NCO
- Family Housing, Officer
- Family Housing, NCO
- Barracks, Troop Quarters
- Bachelor Officer Quarters, Female
- Boundary Fence
- Bachelor Officer Quarters, Male/Female
- Bachelor Enlisted Quarters
- Guest Housing and Temporary Quarters
- Outdoor Recreation Facilities
- Special Weapons Magazine Bulk Storage Area (underground structures)

SITE FEATURES

1. Post Headquarters
2. Post Hospital
3. Officers' Open Mess
4. Post Exchange
5. Commissary
6. Post Office
7. Elementary School
8. Chapel
9. Directorate of Facilities Engineering
10. Telephone Exchange
11. Sewage Treatment Plant
12. Electric Power Substation
13. Flight Obstructions
14. Middle School
15. High School
16. Energy Plants (Steam - Hot Water, Heat; Refrigeration - Air Conditioning)
17. Water Treatment Plant
18. Borrow Pit
19. Ammunition Bunker
20. Gas Chamber/Flame Thrower Range
21. Sanitary Landfill

LOCATION DIAGRAM



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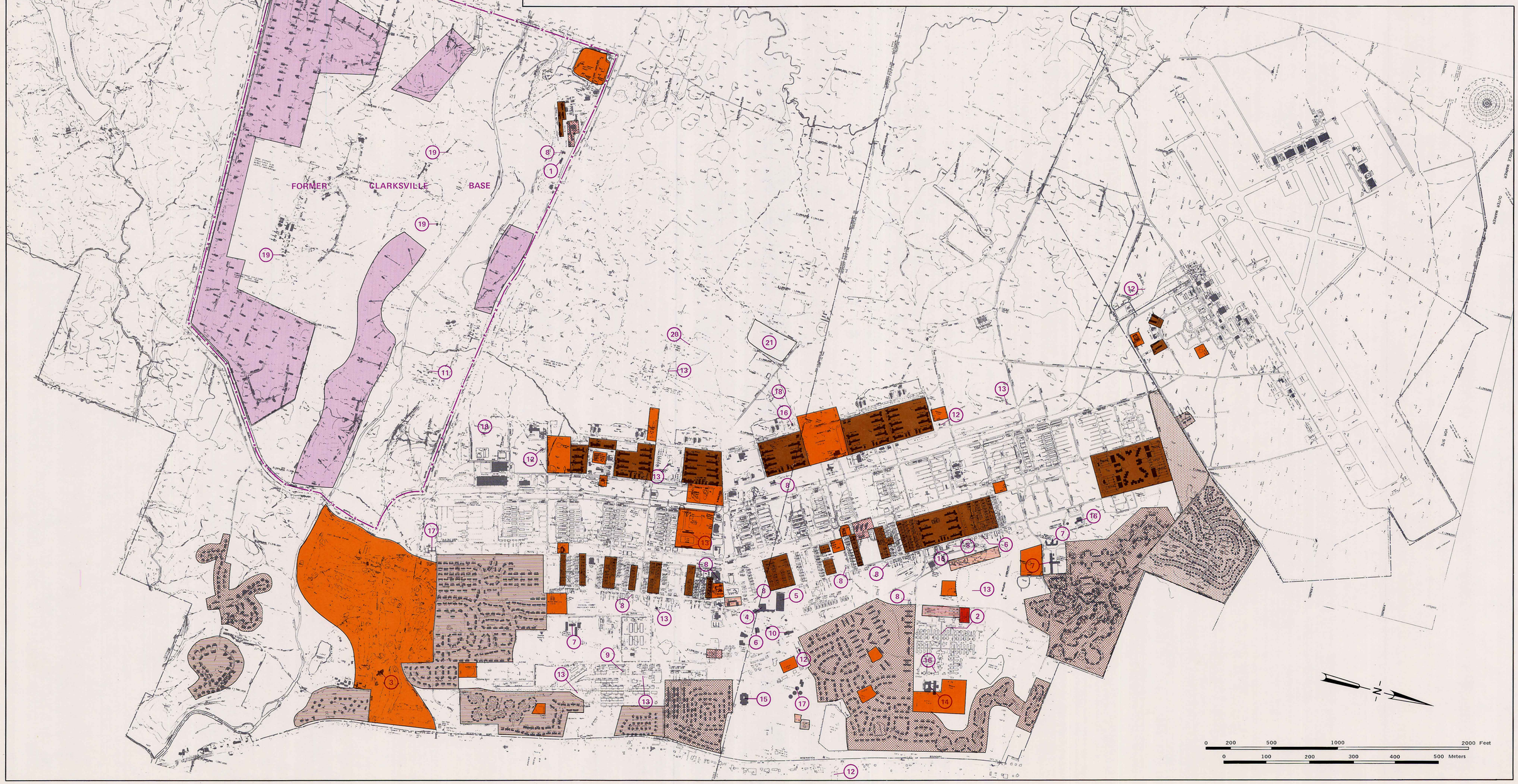


URBAN AREAS (CANTONMENT AREA)

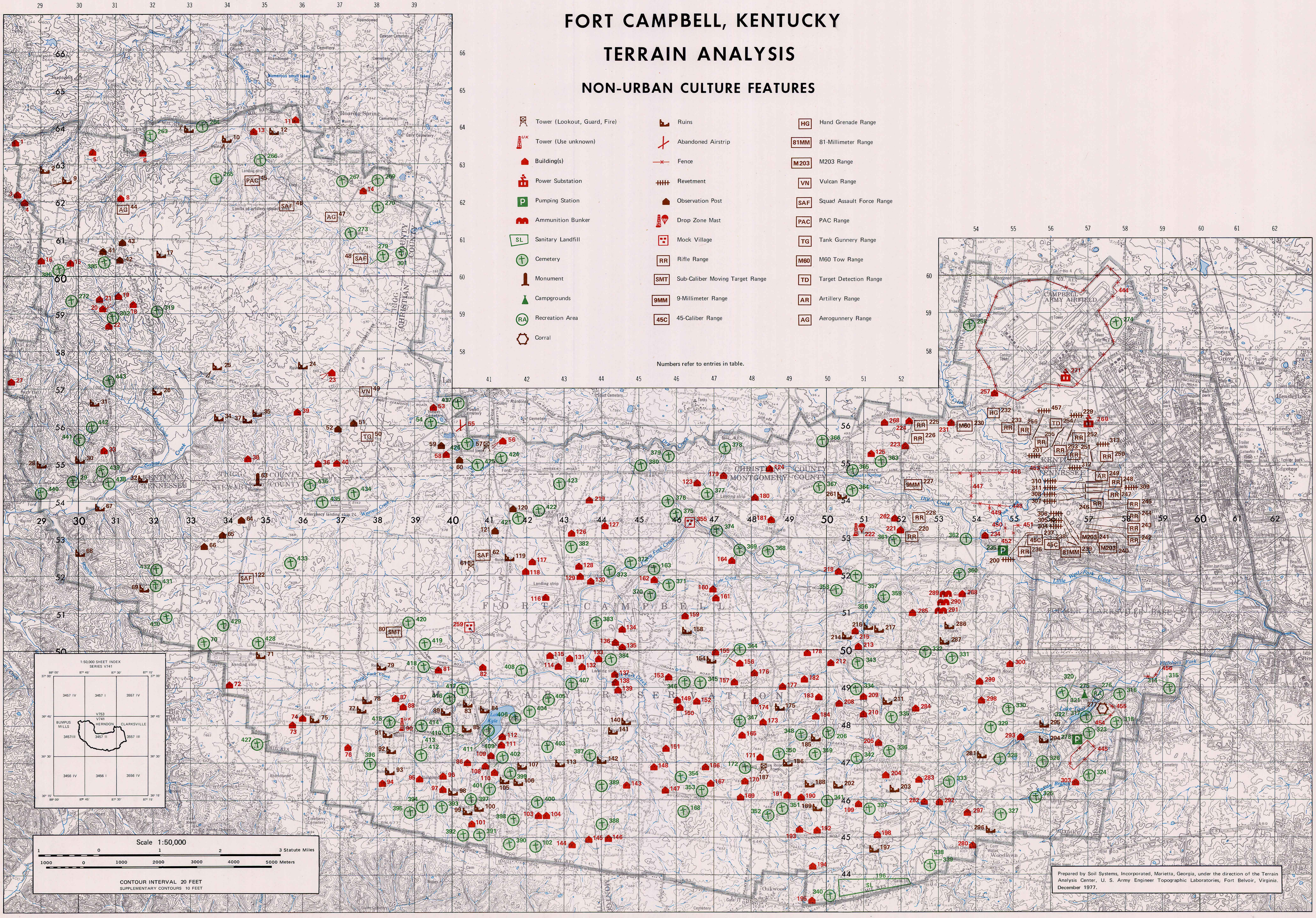
L. NON-URBAN CULTURE FEATURES

MAP NUMBER	GRID REFERENCE	DESCRIPTION
1	284636	Building*
2	290628	Ruins*
3	284621	Building
4	284620	Building
5	304634	2 Buildings
6	317632	Building
7	329639	Ruins
8	311621	2 Buildings
9	293624	Ruins
10	339634	Ruins
11	358642	Building
12	352638	Ruins
13	345638	2 Buildings
14	376623	Building
15	298603	Building
16	290604	Building
17	322605	Ruins
18	315593	Building
19	311596	2 Buildings
20	309593	2 Buildings
21	305594	Building
22	308587	Building
23	365573	2 Buildings
24	359576	Ruins
25	335574	Ruins
26	321569	Ruins
27	284574	2 Buildings
28	290550	Ruins
29	298545	Cemetery*
30	300551	Ruins
31	304566	Ruins
32	317545	Ruins
33	307554	Building
34	337562	Ruins
35	347563	Ruins
36	365550	Building
37	345562	Ruins
38	345552	Building
39	359564	Building
40	369550	Building
41	306606	Observation Post 11; height 9m (30 ft)
42	311604	Observation Post 10; height 9m (30 ft)
43	310609	Observation Post 12; height 9m (30 ft)
44	312618	R41: Aerogunnery Range
45	346625	R34: PAC Range
46	355619	R33: Squad Assault Force Range
47	368616	R42: Aerogunnery Range
48	375605	R32: Squad Assault Force Range
49	377560	R45: Vulcan Range
50	374558	R46: Tank Gunnery Range
51	374561	Observation Post 14; height 9m (30 ft)
52	369559	Observation Post 14; height 9m (30 ft)
53	395565	2 Buildings
54	399561	Hester Cemetery
55	402560	Abandoned Airstrip
56	411555	Buildings
57	409555	Lookout Tower; height 24m (80 ft)
58	398552	Building
59	397555	Observation Post 2; height 9m (30 ft)
60	402551	Observation Post 3; height 9m (30 ft)
61	405523	Tower; height unknown
62	408526	R44: Squad Assault Force Range
63	348546	Monument; Kentucky-Tennessee Boundary
64	343535	Observation Post 8; height 9m (30 ft)
65	338531	Observation Post 9; height 9m (30 ft)
66	332528	Observation Post 7; height 9m (30 ft)
67	305538	Ruins
68	300526	Ruins
69	318517	Ruins
70	336500	Cemetery
71	349499	Ruins
72	341491	Building
73	357480	Building
74	360481	Building
75	363482	Ruins
76	372474	Building
77	376484	Ruins
78	376488	Ruins
79	381496	Ruins
80	385505	R28: Sub-Caliber Moving Target Range
81	397495	Building
82	409496	Building
83	404486	Ruins
84	409484	Ruins
85	403479	Ruins
86	404470	Building
87	384488	2 Buildings
88	388485	Building
89	409485	Ruins
90	387479	Tower; use and height unknown
91	388479	Ruins
92	384473	Ruins
93	383468	Ruins
94	381465	2 Buildings
95	392466	Building
96	398467	2 Buildings
97	398463	Building
98	400463	Ruins
99	404457	Ruins
100	407458	Ruins
101	408453	Building
102	423448	Cemetery
103	423456	Building
104	425456	Building
105	414465	Ruins
106	418465	Ruins
107	419469	Ruins
108	409469	Building
109	410471	Building
110	411468	Building
111	414475	Building
112	414477	Building
113	429470	Ruins
114	428495	Building
115	426499	2 Buildings
116	425514	Building
117	421524	Building
118	420521	Building
119	416525	Ruins
120	416538	Observation Post 5; height 18m (60 ft)
121	411532	Observation Post 6; height 9m (30 ft)
122	345520	R43: Squad Assault Force Range
123	465545	Building
124	485549	Building
125	512552	Building
126	432532	4 Buildings
127	441533	Building
128	441533	Building
129	435519	Building
130	437519	Building
131	431498	Building
132	435495	Building
133	439498	Building
134	446506	Building
135	446501	Building
136	444502	Building
137	444493	Building
138	444491	2 Buildings
139	444490	Building
140	446481	Ruins
141	443478	Ruins
142	439470	Ruins
143	448464	Building
144	432448	2 Buildings
145	438449	Building
146	442450	Building
147	457463	Building
148	454468	2 Buildings
149	460487	Building
150	461485	Building
151	457473	Building
152	467487	Building
153	458493	Building
154	469498	Ruins
155	470499	Building
156	473498	Building
157	476492	Building
158	463505	Ruins
159	463509	Building
160	470516	Building
161	471514	Building
162	454519	Building
163	454522	Building
164	475525	Building
165	478478	Building
166	468469	Building
167	469465	Building
168	462457	Cemetery
169	478461	Building
170	479465	Building
171	480473	Building
172	482468	Cemetery
173	483481	Building
174	481487	2 Buildings
175	487485	Ruins
176	481494	Building
177	488491	Building
178	495500	Building
179	473547	Building
180	481540	3 Buildings
181	485535	4 Buildings
182	494492	Building
183	498488	Building
184	498485	Building
185	498477	Ruins
186	490470	Ruins
187	483469	Fire Lookout Tower; height 24m (80 ft)
188	496464	Ruins
189	498458	Ruins
190	493461	Building
191	490462	Building
192	497452	Building
193	496451	Building
194	496443	2 Buildings
195	496432	2 Buildings
196	512438	City of Clarksville Sanitary Landfill
197	513447	Ruins
198	514451	Building
199	509459	Building
200	554531	Revetment; length 130m (425 ft)
201	562557	Revetment; length 670m (2200 ft)
202	503464	Ruins
203	518468	Ruins
204	519468	Building
205	514475	Building
206	501478	Cemetery
207	501483	Cemetery
208	504486	Building
209	510487	Building
210	510483	Building
211	517487	Ruins
212	501497	Building
213	509501	Building
214	505503	Ruins
215	506508	Building
216	511507	Ruins
217	515507	Ruins
218	503521	2 Buildings
219	437540	Building
220	522531	R 37: M16 Rifle Range
221	521532	3 Buildings
222	509531	Drop Zone Mast; (Bastogne DZ)
223	521555	Building
224	522561	Building
225	525560	R 26: Rifle Range
226	524557	Building
227	523545	Building
228	525535	Building
229	565557	Ruins
230	536561	Building
231	534561	Building
232	545564	Building
233	549559	Ruins
234	542531	Building
235	547527	Building
236	553530	Building
237	556530	Building
238	560529	Cemetery
239	568527	Building
240	569529	Building
241	569531	Building
242	569533	Building
243	569534	Cemetery
244	569535	Building
245	570537	Building
246	572540	Building
247	571542	Cemetery
248	571545	Building
249	573546	Building
250	573549	Building
251	570552	Building
252	568558	Building
253	563557	Building
254	561561	Building
255	558556	Building
256	554558	Building
257	545569	Building
258	538588	Cemetery
259	403507	Mock village; mock Vietnamese fortification, equilateral triangle; sides 457m (1500 ft) long
260	570561	Power Substation
261	504541	Ruins
262	518536	Building
263	319638	Cemetery
264	333640	Cemetery
265	336626	Cemetery
266	349631	Cemetery
267	371624	Cemetery
268	515561	Building
269	380626	Cemetery
270	380619	Cemetery
271	564573	5000 KVA Substation
272	298594	Cemetery
273	372612	Cemetery
274	577587	Cemetery
275	569488	Camp Hinsch (campgrounds)
276	573488	Rod and Gun Club
277	574484	Riding Stables with corral
278	565477	Pump Station
279	375604	Cemetery
280	539448	Building
281	541472	Ruins
282	527459	Building
283	527468	Building
284	524484	Building
285	523511	Building
286	533506	Ruins
287	532502	Ruins
288	533515	Building
289	532515	3 Ammunition Bunkers
290	531513	3 Ammunition Bunkers
291	530511	2 Ammunition Bunkers
292	530460	2 Buildings
293	552474	Building
294	558476	Ruins
295	558480	Ruins
296	544452	Ruins
297	538457	Building
298	542487	Building
299	541492	Building
300	549497	Building

L. NON-URBAN CULTURE FEATURES (Continued)

MAP NUMBER	GRID REFERENCE	DESCRIPTION
301	386607	Cemetery
302	309589	Cemetery
303	567465	Building
304	566528	Revetment; length 404 m (1325 ft)
305	566530	Revetment; length 229 m (750 ft)
306	567530	Revetment; length 137 m (450 ft)
307	569541	Revetment; length 130 m (425 ft)
308	571543	Revetment; length 427 m (1400 ft)
309	571544	Revetment; length 290 m (950 ft)
310	571545	Revetment; length 457 m (1500 ft)
311	569543	Revetment; length 251 m (825 ft)
312	572548	Revetment; length 183 m (600 ft)
313	571552	Revetment; length 335 m (1100 ft)
314	588492	Cemetery
315	591493	Cemetery
316	575487	Cemetery
317	574483	Cemetery
318	577481	Cemetery
319	321591	Cemetery
320	566492	Cemetery
321	565487	Cemetery
322	564482	Cemetery
323	569479	Cemetery
324	568467	Cemetery
325	555461	Cemetery
326	558471	Cemetery
327	546456	Cemetery
328	546471	Cemetery
329	544480	Cemetery
330	549485	Cemetery
331	533498	Cemetery
332	526500	Cemetery
333	528464	Cemetery
334	509487	Cemetery
335	517483	Cemetery
336	515473	Cemetery
337	511457	Cemetery
338	528447	Cemetery
339	531444	Cemetery
340	501435	Cemetery
341	500460	Cemetery
342	508471	Cemetery
343	507500	Cemetery
344	473496	Cemetery
345	465492	Cemetery
346	461492	Cemetery
347	476481	Cemetery
348	493479	Cemetery
349	496476	Cemetery
350	490473	Cemetery
351	489459	Cemetery
352	485457	Cemetery
353	467464	Cemetery
354	461469	Cemetery
355	463535	Mock Village; combat in cities area
356	508512	Cemetery
357	510515	Cemetery
358	501516	Cemetery
359	515515	Cemetery
360	535522	Cemetery
361	516529	Cemetery
362	537530	Cemetery
363	511552	Cemetery
364	507544	Cemetery
365	507548	Cemetery
366	500556	Cemetery
367	498544	Cemetery
368	484527	Cemetery
369	475525	Cemetery
370	453515	Cemetery
371	454519	Cemetery
372	447525	Cemetery
373	442522	Cemetery
374	470533	Cemetery
375	460537	Cemetery
376	457540	Cemetery
377	465545	Cemetery
378	473555	Cemetery
379	457552	Cemetery
380	448548	Cemetery
381	448547	Cemetery
382	431529	Cemetery
383	438507	Cemetery
384	440496	Cemetery
385	307604	Cemetery
386	298603	Cemetery
387	437472	Cemetery
388	440454	Cemetery
389	440464	Cemetery
390	415449	Cemetery
391	407451	Cemetery
392	403451	Cemetery
393	396459	Cemetery (no marker)
394	392459	Cemetery
395	388457	Cemetery (no marker)
396	377470	Cemetery
397	405461	Cemetery (no marker)
398	416456	Cemetery
399	418466	Cemetery
400	421459	Cemetery
401	410464	Cemetery
402	411469	Cemetery
403	425475	Cemetery
404	420485	Cemetery
405	425488	Cemetery
406	416481	Cemetery
407	431491	Cemetery
408	419495	Cemetery
409	411474	Cemetery
410	403477	Cemetery
411	406474	Cemetery
412	393475	Cemetery
413	392477	Cemetery
414	391479	Cemetery
415	387481	Cemetery
416	400487	Cemetery
417	404486	Cemetery
418	397495	Cemetery
419	391503	Cemetery (no marker)
420	387508	Cemetery
421	418536	Cemetery
422	421537	Cemetery
423	429544	Cemetery
424	413551	Cemetery
425	401551	Cemetery
426	400554	Cemetery
427	351476	Cemetery
428	348503	Cemetery
429	339508	Cemetery
430	324510	Cemetery
431	320519	Cemetery
432	321523	Cemetery
433	356524	Cemetery
434	373542	Cemetery
435	364540	Cemetery
436	362544	Cemetery
437	401567	Cemetery
438	308545	Cemetery
439	304546	Cemetery
440	290543	Cemetery
441	301553	Cemetery
442	304560	Cemetery
443	308574	Cemetery
444	Campbell AAF perimeter	Fence; chain-link with barbed wire; height 3 m (10 ft)
445	Sabre Army Heliport perimeter	Fence; chain-link with barbed wire; height 3 m (10 ft)
446	From: 533547 To: 548547	Fence; within impact area
447	From: 538547 To: 538540	Fence; within impact area
448	From: 538539 To: 549538	Fence; within impact area
449	From: 543539 To: 543537	Fence; within impact area
450	From: 548534 To: 548531	Fence; within impact area
451	From: 550534 To: 552534	Fence; within impact area
452	From: 550534 To: 550529	Fence; within impact area
453	From: 557548 To: 561549	Fence; within impact area
454	From: 575481 To: 577483	Fence
455	From: 577484 To: 575485	Fence
456	From: 584493 To: 589495	Fence
457	557560	Revetment; length 425 m (1395 ft)

*Note:
The large number of buildings, ruins and cemeteries found on the installation is attributed to the agricultural use of the land prior to the establishment of Fort Campbell. Many of the dilapidated buildings and ruins are grown over by vegetation and a number of the cemeteries contain only one or two unmarked graves.


FORT CAMPBELL, KENTUCKY
TERRAIN ANALYSIS
NON-URBAN CULTURE FEATURES
Tower (Lookout, Guard, Fire)
Tower (Use unknown)
Building(s)
Power Substation
Pumping Station
Ammunition Bunker
Sanitary Landfill
Cemetery
Monument
Campgrounds
Recreation Area
Corral
Ruins
Abandoned Airstrip
Fence
Revetment
Observation Post
Drop Zone Mast
Mock Village
RR Rifle Range
SMT Sub-Caliber Moving Target Range
9MM 9-Millimeter Range
45C 45-Caliber Range
HG Hand Grenade Range
81MM 81-Millimeter Range
M203 M203 Range
VN Vulcan Range
SAF Squad Assault Force Range
PAC PAC Range
TG Tank Gunnery Range
M60 M60 Tow Range
TD Target Detection Range
AR Artillery Range
AG Aerogunnery Range
Numbers refer to entries in table.
Scale 1:50,000
CONTOUR INTERVAL 20 FEET
SUPPLEMENTARY CONTOURS 10 FEET
Prepared by Soil Systems, Incorporated, Marietta, Georgia, under the direction of the Terrain Analysis Center, U. S. Army Engineer Topographic Laboratories, Fort Belvoir, Virginia. December 1977.

III. OFF-POST FEATURES

Off-post features covered by this study are limited to airfields and urban areas within a 50 mile radius of Fort Campbell. Locations of these features are illustrated in the accompanying map.

AIRFIELDS: There are no airfields within a 50 mile radius of Fort Campbell that have the technical capability of handling cargo-troop transport aircraft equivalent to the C-130 Hercules or larger (124,000 lbs). The Nashville Metropolitan Airport, located 88.8 Km (55.2 mi) to the southeast, has the required capabilities and even though it lies just outside the 50 mile radius has been included in this study. This airfield is readily accessible by Interstate 40 and U.S. 41-70S. The only other significant airfield within the study area is Outlaw Field located in Clarksville, Tennessee within one mile of Fort Campbell to the east of U.S. 41A. Outlaw Field is a civil airfield located at 36°37'N, 87°25'W with two runways. The longest runway is 1,524 meters (5000 ft) in length with an asphalt surface. Weight bearing capacities are S33, T48, and TT75. No weight bearing capacity for C130-A aircraft is provided in the Department of Defense Flight Publications. Fuel grades available: 100/130 and jet fuel ASTM Type A-I without icing inhibitor.

URBAN AREAS: There are 16 urban areas with a population of 2,500 or more within a 50 mile radius of Fort Campbell, in the states of Kentucky and Tennessee. The surrounding region is primarily rural in character with a generally agriculturally oriented economy. All of the urban areas studied and presented herein are incorporated with populations ranging from 2,620 to 451,000. The largest urban area in the region is Nashville, Tennessee. Metropolitan Nashville contains several municipalities, and is presented as one urban region since relevant facilities and services in the area are provided by a consolidated city-county government. Clarksville, Tennessee is the second largest urban area in the region. It has experienced a rapid rate of growth in recent years. The incorporated limits of the City of Clarksville extend to the Kentucky-Tennessee state line and include the Tennessee section of the Fort Campbell cantonment. In 1973, the U.S. Bureau of the Census designated the Clarksville, Montgomery County, Tennessee and the adjacent Hopkinsville, Christian County, Kentucky area as a Standard Metropolitan Statistical Area in recognition of this growth.

The accompanying tables provide data on all cities in the study area in terms of population, housing, education, medical and recreation facilities, and public utilities. Complete data were not available, especially for recent housing market data and educational facilities' plans and capacities for the smaller cities. Where recent housing information was not available for this study, 1970 Census data are presented. Based on regional sales figures, new housing prices in the area rose as much as 115% between 1970 and 1977. Some information is presented on a county-wide basis when not available at the city level. Few of the cities have a formal planning agency as most such activity is at the county level. The regional planning agencies within the area are the Mid-Cumberland Development District (Nashville, Tennessee); the Purchase Area Development District (Mayfield, Kentucky); the Pennyrile Area Development District (Hopkinsville, Kentucky); and the Barren River Area Development District (Bowling Green, Kentucky). In most cases, county-wide data provide the best description of urban-rural growth. School systems are also frequently operated by a county (as in all Tennessee urban areas within the study area).

The major recreational facilities within the study area also cannot be appropriately assigned to one particular city or town because they serve a much larger market. Of particular regional recreational significance are:

Land-Between the Lakes: a 170,000 acre wooded peninsula developed by the Tennessee Valley Authority (TVA) and located between Kentucky Lake and Lake Barkley. Facilities are available for camping, fishing, hunting, boating, picnicking and swimming. A 5,000 acre Environmental Education Center is maintained for use by school study groups.

Kentucky Dam and Lakes: TVA's largest dam was completed in 1944 on the Tennessee River near Gilbertsville, Kentucky creating Kentucky Lake.

Lake Barkley: Formed in the early 1960's by a U.S. Army Corps of Engineers dam, this lake is connected to Kentucky Lake by a free-flowing canal.

Pennyrile Forest State Resort Parks: This Kentucky State Park is located near Dawson Springs and contains a resort lodge as well as facilities for camping, fishing, boating, picnicking, horseback riding, tennis and golfing.

The Tennessee Valley Authority provides electrical power to all of the area surrounding Fort Campbell, as well as the installation. As of June, 1976 the TVA electrical generating capacity was 27,071,480 KW provided by 29 hydroelectric plants, 12 coal-fired plants, 1 nuclear plant and 4 combustion turbine plants. Additional power is provided to the TVA system by 12 Alcoa Dams and 8 Corps of Engineers Dams. It is anticipated that by 1986 the generating capacity will be increased by 20,726,960 KW with the addition of 7 nuclear plants and 1 pumped storage plant. The following data on the TVA system is provided for informational purposes:

Distributor	Total FY 1976 Sales (thousands of KWH)
Benton, Kentucky	39,765
Clarksville, Tennessee	425,243
Dickson, Tennessee	290,035
Franklin, Kentucky	104,705
Hopkinsville, Kentucky	264,285
Murray, Kentucky	170,947
Nashville, Tennessee	6,592,831
Princeton, Kentucky	51,974
Russellville, Kentucky	80,025
Cumberland Electric Membership Corporation	751,741
Meriwether Lewis Electric Membership Corp.	467,358
Total, Study Area Distributors	9,238,909

A. AIRFIELDS

MAP NUMBER AND/OR NAME; LOCATION; TYPE AND CLASSIFICATION	ELEVATION AND STATUS	RUNWAY DESCRIPTION[1]	TAXIWAY, PARKING APRON, AND HARDSTAND AREA DESCRIPTION	BUILDING DESCRIPTION	POL FACILITIES[2]	NAVIGATIONAL AIDS	REMARKS
Name: Nashville Metropolitan **Location:** 36°08'N, 86°04'W **Type:** Airfield **Classification:** Civil (U.S. Air National Guard is tenant)	**Elevation:** Runway 182 m (597 ft) **Status:** Operational	**Longest runway:** 2,438 m (8,000 ft) long; 46 m (150 ft) wide; azimuth 130°-310°; weight bearing capacity-S70, T82, ST120, TT120; asphalt/concrete surface in good condition **Other runways:** 2 additional runways. Runway 2R, 1,227 m (4,026 ft) long; 46 m (150 ft) wide; weight bearing capacity—T84, TT128. Runway 2L, 2,347 m (7,700 ft) long; 46 m (150 ft) wide; weight bearing capacity—T130, TT208	**Taxiways: 31** 30 are 23 m (75 ft) wide; 1 is 15 m (50 ft) wide. Surface material, 7 concrete, 24 asphalt; weight bearing capacities—T77, TT125 (16 taxiways); T84, TT128 (4 taxiways); T130, TT208 (11 taxiways) **Parking Aprons and Hardstand Areas:** Aircarrier area—110,783 m (1,192,463 ft²); weight bearing capacity—TT208; concrete surface Cargo area—25,900 m² (278,789 ft²); weight bearing capacity—TT208; concrete surface Military area (ANG)—133,108 m² (1,432,980 ft²); weight bearing capacity—TT128; asphalt surface General aviation area—151,331 m² (1,629,171 ft²); weight bearing capacity—TT128 (asphalt), TT125 (concrete); concrete and asphalt surface	**Hangars: 18** Floor space: 31,834 m² (342,300 ft²); metal construction. **Maintenance buildings: 16** Floor space: 12,936 m² (139,100 ft²); metal/masonry construction **Administrative-hangar buildings: 3** Floor space: 2,874 m² (30,900 ft²); metal/masonry construction **Administrative-terminal buildings: 11** Floor space: 26,124 m² (280,900 ft²); metal/masonry construction **Cargo warehouses: 6** Floor space: 6,547 m² (70,400 ft²); metal/masonry construction	**Type of fuel:** commercial aviation fuels 100L, jet fuel ASTM Type A; JP-4; contract fuels 100/130, jet fuel ASTM Type A-1 without icing inhibitors provided by M.P. Brothers	**Communications and Navigation:** Control tower, Flight Service Station Nashville, automatic terminal information service, scheduled weather broadcast, VOR-TAC, VHF/DF (very high frequency direction finder); instrument landing system (ILS). **Lighting:** Runway lights, high intensity runway lights, high intensity approach lights, sequenced flashing lights, visual approach slope indicator systems, runway end identifier lights (REIL) (threshhold strobe lights)	Aerodrome is only partially covered by USAF NOTAM system and does not maintain a military NOTAM file

[1] Runway weight bearing capacity in pounds (gross weight of aircraft) is determined by adding 000 to figure following S, T, ST, TT, TDT. Runway weight bearing capacity given is for unlimited operations. Aircraft weight higher than given requires prior permission from aerodrome controlling authority.

- S - Runway weight bearing capacity for aircraft with single-wheel type landing gear (C-47, F100).
- T - Runway weight bearing capacity for aircraft with twin-wheel type landing gear (C-9A).
- ST - Runway weight bearing capacity for aircraft with single-tandem landing gear (C-130).
- TT - Runway weight bearing capacity for aircraft with twin-tandem type (includes quadricycle) landing gear (B-52, C-135).
- TDT - Runway weight bearing capacity for aircraft with twin-delta tandem landing gear (C-5).

For further information, see DOD Flight Information Publication (enroute IFR-Supplement United States).

[2] ASTM - Commercial jet fuels conform to specifications established by the American Society for Testing Materials.

B. URBAN AREAS

NAME AND LOCATION	POPULATION	HOUSING AVAILABILITY	EDUCATION FACILITIES	MEDICAL FACILITIES	RECREATION FACILITIES	PUBLIC UTILITIES*	REMARKS
Benton, KY (Marshall County) 36°51'N 88°21'W	**Benton:** 1970 Census: 3,652 Estimated 1974: 3,540 Projected 1980: No data **Marshall County:** 1970 Census: 20,381 Estimated 1975: 21,570 Projected 1980: 22,958	Total units: 1,440 Renter-occupied: 340 Vacant year-round: 72 **Houses:** Average number for sale: 23 Average sale price: $11,700 Average number for rent: 19 Average monthly rent: $53 **Apartments:** Average number for rent: No data Average monthly rent: No data (1970 data)	**Marshall County Public Schools** **Elementary Schools:** Number of schools: 6 Enrollment capacity: 2,600 Current enrollment (grades K-6): 2,186 1980 projection: 2,100 Expansion plans: None **Junior High Schools:** Number of schools: 3 Enrollment capacity: 1,250 Current enrollment (grades 7-9): 1,184 1980 projection: 1,050 Expansion plans: None **Secondary Schools:** Number of schools: 1 Enrollment capacity: 1,280 Current enrollment (grades 10-12): 1,186 1980 projection: 1,025 Expansion plans: None **Vocational Schools:** Number of schools: 1 (Marshall County Vocational Center in high school) **Special Education Schools:** Number of schools: 1 (Marshall County Special School for the Retarded) (1976-1977 data)	**Doctors:** Total number: 7 Doctor/population ratios: 1/506 **Dentists:** Total number: 5 Dentist/population ratio: 1/708 **Hospitals:** Total number: 1 Total beds: 75 Intensive care units: None Coronary care units: 1 Other special facilities: Lighted heliport Planned expansion: Total of 102 beds by 1981	**Parks:** 1 **Athletic Fields:** 3 **Tennis Facilities:** None **Golf Courses:** None	**Electric Power:** Source: Tennessee Valley Authority Distributor: Benton Electric System Type: Hydroelectric, thermo-electric, nuclear Future plants: 7 nuclear, 1 pumped storage **Sewage Disposal:** Number of plants: 1 Type of treatment: Secondary Flow capacity: 8,000 GPD Average flow: 0.6 MGD Expansion plans: Underway **Heating Fuels:** Types available: Natural gas, propane, butane, distillate fuel oil Expansion plans: No data **Water Supply:** Source: Benton Water and Sewer System, wells Average consumption: 0.4 MGD Treatment capacity: 1.44 MGD Expansion plans: Continuous upgrading program	Education data for Marshall County School System. Education facilities within Benton include one elementary school, one junior high and one high school.
Central City, KY (Muhlenberg County) 37°15'N 87°09'W	**Central City:** 1970 Census: 3,455 Estimated 1975: 3,400 Projected 1980: 3,250 **Muhlenberg County:** 1970 Census: 27,537 Estimated 1975: 28,000 Projected 1980: 28,500	Total units: 1,185 Renter-occupied: 384 Vacant year-round: 86 **Houses:** Average number for sale: No data Average sale price: $45,000 Average number for rent: 0-5 Average monthly rent: $150-$200 **Apartments:** Average number for rent: 0-5 Average monthly rent: $150 (1977 data)	**Central City Independent Public Schools** **Elementary Schools:** Number of schools: 1 Enrollment capacity: 516 Current enrollment (grades K-8): 434 1980 projection: 545 Expansion plans: None **Junior High Schools:** Number of schools: None **Secondary Schools:** Number of schools: 1 Enrollment capacity: 453 Current enrollment (grades 9-12): 449 1980 projection: 470 Expansion plans: None (1976-1977 data)	**Doctors:** Total number: 14 (Muhlenberg County) Doctor/population ratio: 1/2,000 **Dentists:** Total number: 6 (Muhlenberg County) Dentist/population ratio: 1/4,667 **Hospitals:** Total number: None	**Parks:** 3 **Athletic Fields:** 7 **Tennis Facilities:** 5 **Golf Courses:** 2	**Electric Power:** Source: Kentucky Utilities Company/Tennessee Valley Authority Distributor: Same Type: Hydroelectric, thermo-electric, nuclear Future plants: 7 nuclear, 1 pumped storage **Sewage Disposal:** Number of plants: 1 Type of treatment: Secondary Flow capacity: 0.6 MGD Average flow: 0.5 MGD Expansion plans: Underway **Heating Fuels:** Types available: Natural gas, propane, butane, distillate fuel oil Expansion plans: No data **Water Supply:** Source: Water and Sewer Commission, Green River Average consumption: 1 MGD Plant capacity: 2 MGD Expansion plans: No data	1 private elementary school Recreation data for Central City-Greenville area

B. URBAN AREAS (Continued)

NAME AND LOCATION	POPULATION	HOUSING AVAILABILITY	EDUCATION FACILITIES	MEDICAL FACILITIES	RECREATION FACILITIES	PUBLIC UTILITIES*	REMARKS
Clarksville, TN (Montgomery County) 36°30'N 87°23'W	**Clarksville:** 1970 Census: 31,719 Estimated 1975: 38,341 Projected 1980: 43,350 **Montgomery County:** 1970 Census: 62,721 Estimated 1975: 74,000 Projected 1980: 85,272	Total units: 16,621 Renter-occupied: 6,600 Vacant year-round: 597 **Houses:** Average number for sale: 597 Average sale price: $30,200 Average number for rent: No data Average monthly rent: $200 **Apartments:** Average number for rent: 257 Average monthly rent: $150-$210	**Clarksville-Montgomery County Public Schools** **Elementary Schools:** Number of schools: 10 Enrollment capacity: 6,480 Current enrollment (grades K-6): 7,602 1980 projection: 6,999 Expansion plans: 1 new elementary school will increase capacity to 7,180 **Junior High Schools:** Number of schools: 4 Enrollment capacity: 3,000 Current enrollment (grades 7-9): 3,423 1980 projection: 4,235 Expansion plans: 2 new schools will increase capacity to 4,000 **Secondary Schools:** Number of schools: 3 Enrollment capacity: 4,000 Current enrollment (grades 10-12): 4,287 1980 projection: 5,526 Expansion plans: 1 new school will increase capacity to 5,500 **Colleges:** Number of Schools: 1 (Austin Peay State University) 1976 enrollment: 4,200 (1976-1977 data)	**Doctors:** Total number: 36 Doctor/population ratio: 1/1,065 **Dentists:** Total number: 23 Dentist/population ratio: 1/1,667 **Hospitals:** Total number: 1 Total beds: 194 Intensive care units: 1 Coronary care units: 1 Other special facilities: Premature nursery Critical care nursery Suspect nursery Planned expansion: Total of 234 beds by 1980	**Parks:** 12 **Athletic Fields:** 3 **Tennis Facilities:** 3 **Golf Courses:** 3	**Electric Power:** Source: Tennessee Valley Authority Distributor: City of Clarksville, Department of Electricity Type: Hydroelectric, thermo-electric, nuclear Future plants: 7 nuclear, 1 pumped storage **Sewage Disposal:** Number of plants: 3 Type of treatment: Secondary Flow capacity: 5.4 MGD Average flow: 2.99 MGD Expansion plans: Consolidation to single 14 MGD plant planned **Heating Fuels:** Types available: Natural gas, distillate fuel oil, LP gas, coal Expansion plans: No data **Water Supply:** Source: City of Clarksville (Cumberland River and Big West Fork Creek) Average consumption: 6 MGD Expansion plans: No data	Education data for Clarksville-Montgomery County School System
Dawson Springs, KY (Hopkins County) 37°10'N 87°40'W	**Dawson Springs:** 1970 Census: 2,830 Estimated 1975: 2,700 Projected 1980: 2,700 **Hopkins County:** 1970 Census: 38,167 Estimated 1975: 38,900 Projected 1980: 39,800	Total units: 1,093 Renter-occupied: 307 Vacant year-round: 44 **Houses:** Average number for sale: 13 Average sale price: $5,700 Average number for rent: 31 Average monthly rent: $42 **Apartments:** Average number for rent: No data Average monthly rent: No data (1970 data)	**Dawson Springs Independent Public Schools** **Elementary Schools:** Number of schools: 1 Enrollment capacity: 360 Current enrollment (grades K-8): 355 1980 projection: 460 Expansion plans: None **Secondary Schools:** Number of schools: 1 Enrollment capacity: 240 Current enrollment (grades 9-12): 291 1980 projection: 415 Expansion plans: Expansion of existing facility likely (1976-1977 data)	**Doctors:** Total number: 62 (Hopkins County) Doctor/population ratio: 1/1,415 **Dentists:** Total number: 11 (Hopkins County) Dentist/population ratio: 1/3,536 **Hospitals:** Total number: None	**Parks:** 1 **Athletic Fields:** None **Tennis Facilities:** None **Golf Courses:** None	**Electric Power:** Source: Kentucky Utilities Company Distributor: Kentucky Utilities Company Type: Hydroelectric, thermo-electric Future plants: No data **Sewage Disposal:** Number of plants: 1 Type of treatment: Secondary Flow capacity: 0.32 MGD Average flow: 0.29 MGD Expansion plans: No data **Heating Fuels:** Types available: Natural gas, propane, butane Expansion plans: No data **Water Supply:** Source: Dawson Springs City Water and Sewer System, wells Average consumption: 0.5 MGD Plant capacity: 0.72 MGD Expansion plans: No data	Nearest hospital is in Madisonville, Kentucky
Dickson, TN (Dickson County) 36°03'N 87°24'W	**Dickson (city):** 1970 Census: 6,167 Estimated 1975: 6,768 Projected 1980: 7,941 **Dickson County:** 1970 Census: 21,977 Estimated 1975: 26,200 Projected 1980: 28,300	Total units: 2,125 Renter-occupied: 624 Vacant year-round: 111 **Houses:** Average number for sale: 23 Average sale price: $16,800 Average number for rent: 29 Average monthly rent: $67 **Apartments:** Average number for rent: No data Average monthly rent: No data (1970 data)	**Dickson County Public Schools** **Elementary Schools:** Number of schools: 6 Enrollment capacity: No data Current enrollment (grades K-6): 3,460 1980 projection: No data Expansion plans: None **Junior High Schools:** Number of schools: 3 Enrollment capacity: No data Current enrollment (grades 7-9): 1,781 1980 projection: No data Expansion plans: New classrooms planned in one school **Secondary Schools:** Number of schools: 1 Enrollment capacity: No data Current enrollment (grades 10-12): 1,287 1980 projection: No data Expansion plans: None (1976-1977 data)	**Doctors:** Total number: 15 (Dickson County) Doctor/population ratio: 1/1,747 **Dentists:** Total number: 8 (Dickson County) Dentist/population ratio: 1/3,275 **Hospitals:** Total number: 2 Total beds: 140 Intensive care units: 1 Coronary care units: 2 Planned expansion: No data	**Parks:** 2 **Athletic Fields:** 3 **Tennis Facilities:** 1 **Golf Courses:** 1	**Electric Power:** Source: Tennessee Valley Authority Distributor: Dickson Town Electric Department Type: Hydroelectric, thermo-electric, nuclear Future plants: 7 nuclear, 1 pumped storage **Sewage Disposal:** Number of plants: 1 Type of treatment: Secondary Flow capacity: 0.85 MGD Average flow: 0.45 MGD Expansion plans: Additional plant (5 MGD capacity) planned **Heating Fuels:** Types available: Natural gas Expansion plans: No data **Water Supply:** Source: City of Dickson, reservoir Average consumption: 0.6 MGD Expansion plans: No data	Education data is for Dickson County system. Facilities within Dickson include two elementary schools, one junior high school and one high school.
Franklin, KY (Simpson County) 36°42'N 86°34'W	**Franklin:** 1970 Census: 7,176 Estimated 1975: 7,720 Projected 1980: 8,621 **Simpson County:** 1970 Census: 13,054 Estimated 1975: 13,735 Projected 1980: 14,648	Total units: 2,371 Renter-occupied: 828 Vacant year-round: 92 **Houses:** Average number for sale: 60 Average sale price: $30,000 Average number for rent: 0 Average monthly rent: $150 **Apartments:** Average number for rent: 0 Average monthly rent: $150 (1977 data)	**Simpson County Public Schools** **Elementary Schools:** Number of schools: 2 Enrollment capacity: No data Current enrollment (grades K-6): 1,678 1980 projection: No data Expansion plans: No data **Junior High Schools:** Number of schools: 1 Enrollment capacity: No data Current enrollment (grades 7-9): 600 1980 projection: No data Expansion plans: No data **Secondary Schools:** Number of schools: 1 Enrollment capacity: No data Current enrollment (grades 10-12): 900 1980 projection: No data Expansion plans: No data **Vocational Schools:** Number of schools: I planned (1975-1976 data)	**Doctors:** Total number: 7 Doctor/population ratio: 1/1,103 **Dentists:** Total number: 5 Dentist/population ratio: 1/1,544 **Hospitals:** Total number: 1 Total beds: 50 Intensive care units: None Coronary care units: 1 Planned expansion: None	**Parks:** 2 **Athletic Fields:** 5 **Tennis Facilities:** 1 **Golf Courses:** 1	**Electric Power:** Source: Tennessee Valley Authority Distributor: Franklin Electric Plant Board Type: Hydroelectric, thermo-electric, nuclear Future plants: 7 nuclear, 1 pumped storage **Sewage Disposal:** Number of plants: 1 Type of treatment: Secondary Flow capacity: 1.2 MGD Average flow: 1.0 MGD Expansion plans: 201 Plan underway **Heating Fuels:** Types available: Natural gas, propane, butane, fuel oil Expansion plans: No data **Water Supply:** Source: City of Franklin Water Works, Drakes Creek Average consumption: 1.7 MGD Plant capacity: 3.5 MGD Expansion plans: Underway	Vocational Education Program at High School.
Greenbrier, TN (Robertson County) 36°21'N 86°48'W	**Greenbrier:** 1970 Census: 2,279 Estimated 1975: 2,620 Projected 1980: 2,725 **Robertson County:** 1970 Census: 29,102 Estimated 1975: 31,900 Projected 1980: 34,800	Total units: 724 Renter-occupied: 99 Vacant year-round: No data Number for sale and rent: 21 Median sale price: $11,000 Median rent: $57 (1970 data)	**Robertson County Public Schools** **Elementary Schools:** Number of schools: 9 Enrollment capacity: 4,000 Current enrollment (grades K-6): 4,329 1980 projection: 4,400 Expansion plans: Additions to two schools, construction of one new school **Junior High Schools:** Number of schools: 2 Enrollment capacity: 1,100 Current enrollment (grades 7-9): 1,909 1980 projection: 1,250 Expansion plans: One additional school planned **Vocational Schools:** Number of schools: 1 (Robertson County Vocational Center) (1976-1977 data)	**Doctors:** Total number: 13 (Robertson County) Doctor/population ratio: 1/2,454 **Dentists:** Total number: 11 (Robertson County) Dentist/population ratio: 1/2,900 **Hospitals:** Total number: None	**Parks:** 1 **Athletic Fields:** 3 **Tennis Facilities:** None **Golf Courses:** 1	**Electric Power:** Source: Tennessee Valley Authority Distributor: Cumberland Electric Membership Corporation Type: Hydroelectric, thermo-electric, nuclear Future plants: 7 nuclear, 1 pumped storage **Sewage Disposal:** Number of plants: 1 Type of treatment: Secondary Flow capacity: 0.3 MGD Average flow: 0.221 MGD Expansion plans: Underway to 0.51 MGD **Heating Fuels:** Types available: Natural gas Expansion plans: No data **Water Supply:** Source: City of Greenbrier, reservoir Average consumption: 0.272 MGD Expansion plans: No data	Robertson County School system includes 14 facilities with varying grade levels. Facilities within Greenbrier include one elementary school (grades K-6); one junior high school (grades 7-8); and one high school (grades 9-12).

B. URBAN AREAS (Continued)

NAME AND LOCATION	POPULATION	HOUSING AVAILABILITY	EDUCATION FACILITIES	MEDICAL FACILITIES	RECREATION FACILITIES	PUBLIC UTILITIES*	REMARKS
Greenville, KY (Muhlenberg County) 37°11'N 87°11'W	**Greenville:** 1970 *Census*: 3,875 Estimated 1975: No data Projected 1980: No data **Muhlenberg County:** 1970 Census: 27,537 Estimated 1975: 28,000 Projected 1980: 28,500	Total units: 1,300 *Renter-occupied*: 338 Vacant year-round: 55 **Houses:** Average number for sale: 10 Average sale price: $15,000 Average number for rent: 45 Average monthly rent: $61 **Apartments:** Average number for rent: No data Average monthly rent: No data (1970 data)	**Greenville Independent Public Schools** **Elementary Schools** Number of schools: 1 Enrollment capacity: 650 Current enrollment (grades 1-6); 434 1980 projection: 500 Expansion plans: None **Secondary Schools:** Number of schools: 1 Enrollment capacity: 600 Current enrollment (grades 7-12): 452 1980 projection: 510 Expansion plans: None **Vocational Schools:** *Number of schools*: 1 (Muhlenberg County Vocational Extension Center) (1976-1977 data)	**Doctors:** Total number: 14 (Muhlenberg County) Doctor/population ratio: 1/2,000 **Dentists:** Total number: 6 (Muhlenberg County) Dentist/population ratio: 1/4,667 **Hospitals:** Total number: 1 Total beds: 105 Intensive care units: 1 Coronary care units: 1 Other special facilities: Hemodialysis, Inhalation therapy Planned expansion: None	**Parks:** 3 ***Athletic Fields*:** 7 **Tennis Facilities:** 5 **Golf Courses:** 2	**Electric Power:** Source: Kentucky Utilities Company/Tennessee Valley Authority Distributor: Same Type: Hydroelectric, thermo-electric, nuclear Future plants: 7 nuclear, 1 pumped storage **Sewage Disposal:** Number of plants: 1 Type of treatment: *Secondary* Flow capacity: 0.5 MGD Average flow: 0.35 MGD Expansion plans: No data **Heating Fuels:** Types available: Natural gas Expansion plans: No data **Water Supply:** Source: City of Greenville, reservoir *Average consumption*: 0.6 MGD Plant capacity: 0.75 MGD Expansion plans: Underway	1 private elementary school.
Hopkinsville, KY (Christian County) 36°50'N 87°28'W	**Hopkinsville:** 1970 Census: 21,250 Estimated 1975: No data Projected 1980: No data **Christian County:** 1970 Census: 56,224 Estimated 1975: 60,500 Projected 1980: 65,400	Total units: 8,087 Renter-occupied: 2,884 Vacant year-round: 614 **Houses:** Average number for sale: 387 Average sale price: $32,041 Average number for rent: No data Average monthly rent: No data **Apartments:** Average number for rent: No data Average monthly rent: $100-$230 (1977 data)	**Christian County Public Schools** **Elementary Schools:** Number of schools: 9 Enrollment capacity: No data *Current enrollment (grades K-6)*: 4,700 1980 projection: No data Expansion plans: None **Junior High Schools:** Number of schools: 3 Enrollment capacity: No data Current enrollment (grades 7-9): 2,865 *1980 projection: No data* Expansion plans: New school planned **Secondary Schools:** Number of schools: 2 Enrollment capacity: No data 1975 enrollment: 2,970 *1980 projection: No data* Expansion plans: None **Vocational Schools:** Number of schools: 1 (Christian County Area Vocational Center) **Colleges:** Number of Schools: 1 (Hopkinsville Community College) 1975 enrollment: 950 (1974-1975 data)	**Doctors:** Total number: 62 (Christian County) Doctor/population ratio: 1/976 **Dentists:** *Total number: 15 (Christian County)* Dentist/population ratio: 1/4,033 **Hospitals:** Total Number: 1 Total beds: 264 Intensive care units: 1 Coronary care units: 1 Other special facilities: Colbalt treatment Planned expansion: No data	**Parks:** 8 **Athletic Fields:** 12 **Tennis Facilities:** 3 **Golf Courses:** 2	**Electric Power:** Source: Tennessee Valley Authority Distributor: Hopkinsville Electric Plant Board Type: Hydroelectric, thermo-electric, nuclear *Future plants: 7 nuclear, 1 pumped* storage **Sewage Disposal:** Number of plants: 1 Type of treatment: Secondary Flow capacity: 3 MGD Average flow: 2.3 MGD *Expansion plans:* Underway—to construct second plant **Heating Fuels:** Types available: Natural gas, propane, butane, fuel oil Expansion plans: No data **Water Supply:** Source: City of Hopkinsville, Little River and 4 impounded lakes Average consumption: 3.78 MGD Plant capacity: 5.0 MGD Expansion plans: underway—plant capacity to be increased to 7 MGD	Education facilities data for Christian County Public Schools.
Madisonville, KY (Hopkins County) 37°30'N 87°30'W	**Madisonville:** 1970 Census: 15,332 Estimated 1975: No data Projected 1980: No data **Hopkins County:** 1970 Census: 38,167 *Estimated 1975: 38,900* Projected 1980: 39,800	Total units: 5,236 Renter-occupied: 1,785 Vacant year-round: 124 **Houses:** Average number for sale: 161 Average sale price: $32,300 *Average number for rent*: 0 Average monthly rent: $125-$250 **Apartments:** Average number for rent: 6 Average monthly rent: $100-$250 (1977 data)	**Hopkins County Public Schools** **Elementary Schools:** Number of schools: 16 Enrollment capacity: No data Current enrollment (grades 1-8): 6,205 1980 projection: No data *Expansion plans: Classroom expansion* at 4 schools **Secondary Schools:** Number of schools: 4 Enrollment capacity: No data Current enrollment (grades 9-12): 1,806 1980 projection: No data Expansion plans: None **Vocational Schools:** Number of schools: 1 **Colleges:** Number of schools: 1 (Madisonville Community College) 1975-76 enrollment: 476 (1975-1976 data)	**Doctors:** Total number: 62 (Hopkins County) Doctor/population ratio: 1/627 **Dentists:** Total number: 11 (Hopkins County) Dentist/population ratio: 1/3,536 **Hospitals:** Total number: 1 Total beds: 272 Intensive care units: 1 Coronary care units: 1 Other special facilities: Nuclear medicine Planned expansion: No data	**Parks:** 3 **Athletic Fields:** 8 **Tennis Facilities:** 5 **Golf Courses:** 2	**Electric Power:** Source: Kentucky Utilities Company Distributor: Madison Municipal Light and Water Plant Type: Hydroelectric and thermo-electric Future plants: No data **Sewage Disposal:** *Number of plants*: 1 Type of treatment: Secondary Flow capacity: 2 MGD Average flow: 1.85 MGD Expansion plans: No data **Heating Fuels:** Types available: Natural gas, propane, butane, distillate oil Expansion plans: No data **Water Supply:** Source: City of Madisonville, from reservoir Adequacy of service: Adequate average pressure 40 to 50 psi *Expansion plans:* Plant and distribution system expansion underway	Educational facilities data for Hopkins County Public Schools
Murray, KY (Calloway County) 36°39'N 88°17'W	**Murray:** 1970 Census: 13,537 Estimated 1975: No data Projected 1980: No data ***Calloway County*:** 1970 Census: 27,692 Estimated 1975: 29,457 Projected 1980: 31,573	Total units: 4,183 Renter-occupied: 2,160 Vacant year-round: 176 **Houses:** *Average number for sale*: 200 Average sale price: $32,000 Average number for rent: 10 Average monthly rent: $150 **Apartments:** Average number for rent: 21 Average monthly rent: $105 (1977 data)	**Murray Independent Public Schools** **Elementary Schools:** Number of schools: 2 Enrollment capacity: 660 *Current enrollment* (grades K-6): 766 1980 projection: 620 Expansion plans: None **Junior High Schools:** Number of schools: 1 Enrollment capacity: 750 Current enrollment (grades 7-9): 672 1980 projection: 620 Expansion plans: None **Secondary Schools:** Number of schools: 1 Enrollment capacity: 740 Current enrollment (grades 10-12): 633 1980 projection: 600 Expansion plans: None **Vocational Schools:** Number of schools: 1 (Murray Area Vocational Education Center) **Colleges:** Number of Schools 1 (*Murray* State University) 1976 enrollment: 7,106 (1976-1977 data)	**Doctors:** Total number: 20 *Doctor/population ratio*: 1/677 (Based on 1970 population) **Dentists:** Total number: 11 Dentist/population ratio: 1/1,231 (Based on 1970 population) **Hospitals:** Total number: 1 Total beds: 138 Intensive care units: 1 Coronary care units: 1 Other special facilities: Cardiac care unit linked by computer to Vanderbilt Hospital in Nashville Planned expansion: Total of 178 beds by 1981	**Parks:** 1 **Athletic Fields:** 10 **Tennis Facilities:** 2 **Golf Courses:** 2	**Electric Power:** Source: Tennessee Valley Authority Distributor: Murray Electric System Type: Hydroelectric, thermo-electric, nuclear Future plants: 7 nuclear, 1 pumped storage **Sewage Disposal:** Number of plants: 1 Type of treatment: Secondary Flow capacity: 2.5 MGD Average flow: 1.7 MGD Expansion plans: Completed 1976 **Heating Fuels:** Types available: Natural gas propane, butane, distillate fuel oil Expansion plans: No data **Water Supply:** Source: Murray Water and Sewer System, 5 wells *Adequacy of service*: Adequate, average pressure 50 psi Expansion plans: Mains being added and replaced, new well planned	

B. URBAN AREAS (Continued)

NAME AND LOCATION	POPULATION	HOUSING AVAILABILITY	EDUCATION FACILITIES	MEDICAL FACILITIES	RECREATION FACILITIES	PUBLIC UTILITIES*	REMARKS
Nashville, TN (Davidson County) 36°10'N 86°48'W Nashville-Davidson County Metropolitan Area includes all of Davidson County and the cities of Belle Meade, Berry Hill, Forest Hills, Goodlettsville, Lakewood, Nashville and Oak Hill.	**Nashville-Davidson County:** 1970 Census: 447,877 Estimated 1975: 451,000 Projected 1980: 483,056 **Recent Population Estimates for Largest Incorporated and Suburban Areas:** *Belle Meade: 2,949 Bordeaux: 3,000 Criwe Hall: 3,000 Donelson: 25,500 *Forest Hills: 4,279 *Goodlettsville: 6,168 Hermitage: 6,000 Hermitage Hills: 4,000 Hillwood: 3,500 Inglewood: 20,000 Madison: 21,500 Maplewood: 3,000 Oak Hill: 4,671 Old Hickory: 6,000 West Meade: 5,300 (1970-1974 data) *incorporated	Total units: 161,190 Renter-occupied: 64,476 Vacant year-round: 1,840 (1975 data) **Houses:** Average number for sale: 800 Average sale price: $37,000 Average number for rent: No data Average monthly rent: No data **Apartments:** Average number for rent: No data Average monthly rent: $200 (1977 data)	**Elementary Schools:** Number of schools: 92 Enrollment capacity: No data 1976 enrollment: 40,159 1980 projection: See remarks Expansion plans: None **Intermediate Schools:** Number of schools: 20 Enrollment capacity: No data 1976 enrollment: 20,328 1980 projection: See remarks Expansion plans: None **Secondary Schools:** Number of schools: 18 Enrollment capacity: No data 1976 enrollment: 18,539 1980 projection: See remarks Expansion plans: 2 additional high schools by 1978-79; addition of vocational wings at 3 schools by 12/77 (1976-1977 data) **Colleges:** Number of schools: 8 (Belmont College, D. Lipscomb College, Fisk University, G. Peabody College for Teachers, Meharry Medical Collge, Trevecca Nazarene College, Tennessee State University, Vanderbilt University) 1975 enrollment: 20,859 (1975-1976 data)	**Doctors:** Total number: 1,115 Doctor/population ratio: 1/405 **Dentists:** Total number: 289 Dentist/population ratio: 1/1,561 **Hospitals:** Total number: 13 Total beds: 4,325 Intensive care units: 10 Coronary care units: 9 Other special facilities: 1 burn care unit 4 alcoholic units 2 drug treatment centers 7 premature nurseries Planned expansion: Available plans indicate minimum of approximately 300 additional beds by 1980-1981	**Parks:** 7 **Athletic Fields:** 64 **Tennis Facilities:** 23 **Golf Courses:** 13	**Electric Power:** Source: Tennessee Valley Authority Distributor: Nashville electric Service Type: Hydroelectric, thermo-electric, nuclear Future plants: 7 nuclear, 1 pumped storage **Sewage Disposal:** Number of plants: 18 Type of treatment: Primary, secondary and tertiary Flow capacity: 96.4 MGD Average flow: 65.2 MGD (data from 7 plants) Expansion plans: 201 circawide program underway **Heating Fuels:** Types available: Natural gas, LP gas, fuel oil, coal **Water Supply:** Source: 5 utility districts, Cumberland River and tributaries Average consumption: 68.1 MGD (data from 4 districts) Expansion plans: Underway	Enrollment in Davidson-Nashville metro schools had a peak total of approximately 95,000 in 1970 and has been dropping since. Projected total enrollment for Fall, 1977 is approximately 75,000. 43 private schools in Nashville-Davidson County area with 1976-1977 enrollment (grades K-12) of 16,030.
Princeton, KY (Caldwell County) 37°07'N 87°52'W	**Princeton:** 1970 Census: 6,292 Estimated 1975: 6,850 Projected 1980: 7,500 **Caldwell County:** 1970 Census: 13,179 Estimated 1975: 13,900 Projected 1980: 14,800	Total units: 2,290 Renter-occupied: 847 Vacant year-round: 68 **Houses:** Average number for sale: No data Average sale price: $40,000 Average number for rent: 0 Average monthly rent: $200 **Apartments:** Average number for rent: 0 Average monthly rent: $200 (1977 data)	**Caldwell County Public Schools** **Elementary Schools:** Number of schools: 2 Enrollment capacity: 850 Current enrollment (grades K-6): 1,229 1980 projection: 900 Expansion plans: None **Junior High Schools:** Number of schools: 1 Enrollment capacity: 750 Current enrollment (grades 7-9): 698 1980 projection: 800 Expansion plans: None **Secondary Schools:** Number of schools: 1 Enrollment capacity: 650 1975 enrollment: 536 1980 projection: 700 Expansion plans: Eight new classrooms planned by 1980 **Vocational Schools:** Number of schools: 1 (1976-1977 data)	**Doctors:** Total number: 5 (Caldwell County) Doctor/population ratio: 1/2,780 **Dentists:** Total number: 4 (Caldwell County) Dentist/population ratio: 1/3,475 **Hospitals:** Total number: 1 Total beds: 55 Intensive care units: None Coronary care units: 1 Planned expansion: No data	**Parks:** 2 **Athletic Fields:** 10 **Tennis Facilities:** 6 **Golf Courses:** 1	**Electric Power:** Source: Tennessee Valley Authority Distributor: Princeton Electric Plant Board Type: Hydroelectric, thermo-electric, nuclear Future plants: 7 nuclear, 1 pumped storage **Sewage Disposal:** Number of plants: 1 Type of treatment: Secondary Flow capacity: 1 MGD Average flow: 0.534 MGD Expansion plans: Collection main expansion underway **Heating Fuels:** Types available: Natural gas, propane, butane, distillate fuel oil Expansion plans: No data **Water Supply:** Source: City of Princeton Water and Sewer Works, Lake Barkley Adequacy of service: Good, average pressure 58 psi Expansion plans: No data	Private elementary school, enrollment 72. (1975)
Russellville, KY (Logan County) 36°48'N 86°51'W	**Russellville:** 1970 Census: 6,456 Estimated 1975: 6,936 Projected 1980: 7,424 **Logan County:** 1970 Census: 21,793 Estimated 1975: 22,929 Projected 1980: 24,467	Total units: 2,358 Renter-occupied: 866 Vacant year-round: 144 **Houses:** Average number for sale: 10 Average sale price: $11,900 Average number for rent: 58 Average monthly rent: $50 **Apartments:** Average number for rent: No data Average monthly rent: No data (1970 data)	**Russellville Independent Public Schools** **Elementary Schools:** Number of schools: 2 Enrollment capacity: 725 Current enrollment (grades K-6): 676 1980 projection: 750 Expansion plans: None **Junior High Schools:** Number of schools: 1 Enrollment capacity: 540 Current enrollment (grades 7-9): 480 1980 projection: 530 Expansion plans: None **Secondary Schools:** Number of schools: 1 Enrollment capacity: 540 Current enrollment (grades 10-12): 475 1980 projection: 550 Expansion plans: None **Vocational Schools:** Number of schools: 1 (1976-1977 data)	**Doctors:** Total number: No data Doctor/population ratio: No data **Dentists:** Total number: No data Dentist/population ratio: No data **Hospitals:** Total number: I Total beds: III Intensive care units: None Coronary care units: I Planned expansion: None	**Parks:** 3 **Athletic Fields:** 8 **Tennis Facilities:** 7 **Golf Courses:** 2	**Electric Power:** Source: Tennessee Valley Authority Distributor: Russellville Electric Plant Board Type: Hydroelectric, thermo-electric, nuclear Future plants: 7 nuclear, 1 pumped storage **Sewage Disposal:** Number of plants: 1 Type of treatment: Secondary Flow capacity: 1.2 MGD Average flow: 0.9 MGD Expansion plans: New treatment plant to be constructed **Heating fuels:** Types available: Natural gas, propane, butane, distillate fuel oil Expansion plans: None available **Water Supply:** Source: Russellville Water and Sewer Department, 2 lakes Adequacy of service: Good, Average pressure 87 psi Expansion plans: Underway	
Springfield, TN (Robertson County) 36°30'N 86°53'W	**Springfield:** 1970 Census: 9,720 Estimated 1975: 10,468 Projected 1980: 11,623 **Robertson County:** 1970 Census: 29,102 Estimated 1975: 31,900 Projected 1980: 34,800	Total units: 3,326 Renter-occupied: 1,426 Vacant year-round: 175 **Houses:** Average number for sale: 45 Average sale price: $15,900 Average number for rent: 64 Average monthly rent: $48 **Apartments:** Average number for rent: No data Average monthly rent: No data (1970 data)	**Robertson County Public Schools** **Elementary Schools:** Number of schools: 9 Enrollment capacity: 4,000 Current enrollment (grades K-6): 4,329 1980 projection: 4,400 Expansion plans: Additions to two schools, construction of one new school **Junior High Schools:** Number of schools: 2 Enrollment capacity: 1,100 Current enrollment (grades 7-9): 1,909 1980 projection: 1,250 Expansion plans: One new school planned **Secondary Schools:** Number of schools: 2 Enrollment capacity: 2,250 Current enrollment (grades 10-12): 1,478 1980 projection: 2,500 Expansion plans: One new school planned **Vocational Schools:** Number of schools: 1 (Robertson County Vocational Center) (1976-1977 data)	**Doctors:** Total number: 13 (Robertson County) Doctor/population ratio: 1/2,454 **Dentists:** Total number: 11 (Robertson county) Dentist/population ratio: 1/2,900 **Hospitals:** Total number: 1 Total beds: 160 Intensive care units: None Coronary care units: 2 Other special facilities: Premature nursery Planned expansion: No data	**Parks:** 2 **Athletic Fields:** 1 **Tennis Facilities:** 1 **Golf Courses:** 1	**Electric Power:** Source: Tennessee Valley Authority Distributor: Springfield Department of Electricity Type: Hydroelectric, thermo-electric, nuclear Future plants: 7 nuclear, 1 pumped storage **Sewage Disposal:** Number of plants: 1 Type of treatment: Secondary Flow capacity: 2.5 MGD Average flow: 1.76 MGD Expansion plans: Expansion to tertiary facility by 1980 **Heating Fuels:** Types available: Natural gas, LP gas, distillate fuel Expansion plans: No data **Water Supply:** Source: City of Springfield, Sulfur Fork Creek Adequacy of service: Good Expansion plans: No data	Educational data is for Robertson County School system. Facilities within Springfield include five elementary schools (one K-3 facility, one K-8 facility, one I-8 facility, one 4-5 facility, one 6-7 facility); one junior high school (grades 8-9); and one high school (grades 10-12).

B. URBAN AREAS (Continued)

NAME AND LOCATION	POPULATION	HOUSING AVAILABILITY	EDUCATION FACILITIES	MEDICAL FACILITIES	RECREATION FACILITIES	PUBLIC UTILITIES*	REMARKS
Waverly, TN (Humphreys County) 36°04'N 87°46'W	**Waverly:** 1970 Census: 3,794 Estimated 1975: 3,984 Projected 1980: 4,253 **Humphreys County:** 1970 Census: 13,560 Estimated 1975: 14,900 Projected 1980: 15,200	Total units: 1,304 Renter-occupied: 365 Vacant year-round: 62 **Houses:** Average number for sale: 23 Average sale price: $11,500 Average number for rent: 21 Average monthly rent: $59 **Apartments:** Average number for rent: No data Average monthly rent: No data (1970 data)	**Humphreys County Public Schools** **Elementary Schools:** Number of schools: 3 Enrollment capacity: 2,553 Current enrollment (grades K-8): 2,859 1980 projection: 3,553 Expansion plans: None **Secondary Schools:** Number of schools: 2 Enrollment capacity: 800 Current enrollment (grades 9-12): 793 1980 projection: 900 Expansion plans: None (1976-1977 data)	**Doctors:** Total number: 4 (Humphreys County) Doctor/population ratio: 1/3,475 **Dentists:** Total number: 5 (Humphreys County) Dentist/population ratio: 1/2,780 **Hospitals:** Total number: 1 Total beds: 52 Intensive care units: 1 Coronary care units: None Other special facilities: Suspect nursery Planned expansion: No data	**Parks:** 3 **Athletic Fields:** 2 **Tennis Facilities:** 1 **Golf Courses:** 1	**Electric Power:** Source: Tennessee Valley Authority Distributor: Meriwether Lewis Electric Cooperative Type: Hydroelectric, thermo-electric, nuclear Future plants: 7 nuclear, 1 pumped storage **Sewage Disposal:** Number of plants: 1 Type of treatment: Secondary lagoon Flow capacity: 2 MGD Average flow: More than 2 MGD Expansion plans: Under consideration **Heating Fuels:** Types available: Natural gas, coal, distillate fuel oil Expansion plans: No data **Water Supply:** Source: City of Waverly, Duck River and wells Average consumption: 0.6 MGD Expansion plans: No data	Education data for Humphreys County School system. Facilities within Waverly include one elementary school (grade K-3); one junior high school (grade levels unavailable); and one high school (grades 9-12).

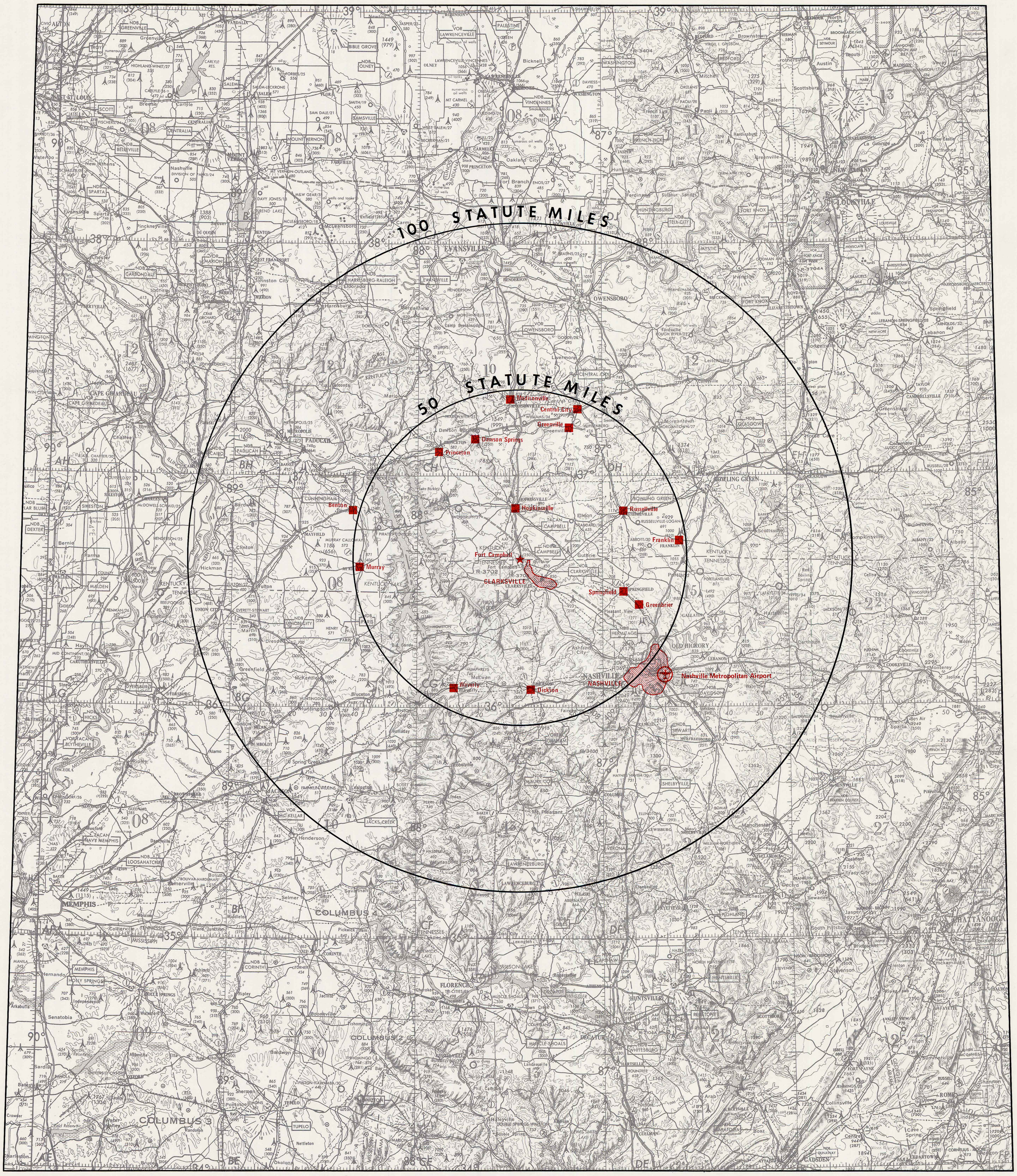
*MGD refers to million gallons per day.

GPD refers to the flow or capacity in gallons per day.

PSI refers to pounds per square inch of pressure.

FORT CAMPBELL, KENTUCKY

TERRAIN ANALYSIS



Scale 1:1,000,000

20 0 20 40 60 Statute Miles

20 0 20 40 60 80 Kilometers

OFF-POST FEATURES

- Urban Areas
- Airfield
- Cantonment Area

Prepared by Soil Systems, Incorporated, Marietta, Georgia, under the direction of the Terrain Analysis Center, U. S. Army Engineer Topographic Laboratories, Fort Belvoir, Virginia. December 1977.

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